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Editorial

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This is the eleventh issue this year which is very rich with papers from the Region including Saudi Arabia, Qatar, Iraq, UK, and Canada. The topics are of great interest to primary care and family physicians.

Al Thagfan et al., did a cross-sectional study aiming at assessing the public awareness regarding the effects of food and sunlight on vitamin D homeostasis in Al-Madinah Al-Munawwarah. The authors found that 91% of the participant (n=719) had a sufficient knowledge about vitamin D. High atmospheric temperature causes low participants' exposure to sunlight followed by absence of appropriate places and lack of suitable time. We found that 47.6% (n=367) of participants are taking vitamin D supplements with females as a majority (62.8%) (n=267) vs (29.9%) (n=109) for males. Females' clothes cause less exposure to sunlight and 38.4% (n=150). Participants in the healthcare fields (48.9%, n=170) are staying more in the sunlight in a 15 minutes duration. (p=0.016). The authors concluded that it is recommended to increase the number of outdoor walking sites. Awareness level and health education regarding vitamin D need to be improved in the population of Almadinah Almunawwarah.

Al Saleeem et al., cross-sectional study included 751 female students at Health Colleges of KKU, to assess how far female students at King Khalid University (KKU) use contact lens and to assess their practices and care of contact lenses. Two-thirds (66.2%) used contact lenses, mainly soft lenses (82.7%) and for cosmetic reasons (23.3%) and to correct errors of refraction (29.4%). (56.5%) of

participants used contact lenses for 4-7 hours daily. The authors concluded that most students used it as cosmetic. They mostly obtain it from glasses shops. Their awareness is suboptimal and lack proper practices. Their awareness and practices should be increased.

Prof Allilhaibi did a comparative case-control study to assess prevalence of exclusive breastfeeding practices and risk factors for failure to fulfill exclusive breastfeeding for twins delivered in Saudi Arabia. This study comprised 178 mothers who delivered twins and 122 mothers who delivered singleton babies. The author concluded that twins usually start their first breastfeeding later than singleton babies, and also tend to achieve exclusive breastfeeding less than singleton babies. Exclusive breastfeeding is less practiced by mothers whose children are admitted to NICU and whose children did not start breastfeeding within the first 6 hours. Mothers of twin babies are less confident than those of singleton babies regarding being able to exclusively breastfeed their babies. Rooming-in of mothers with their babies should be allowed at NICU.

Soliman et al., did an audit intended to evaluate current practice of PPIs prescriptions against best practice international guideline and suggest changes for improvement.

50 medical records were identified by simple random sampling from total of 2021 patient's health records who had been prescribed PPI prescribed during the audit period from 1st October to December 2019 and review retrospectively based on the audit criteria. Findings found showed PPIs were prescribed for justified indications in 24/50(49%) health records. 26/50(51%) cases PPIs prescriptions were found for unjustified clinical indications. However, duration for prescribing PPIs according to its specific indication were found suitable in 9/24(37.5%) health records. PPIs stop date was not documented in 41/50(82%) health records but it was documented in 9/50 (18%) health records.

Al-Qasem et al., did a descriptive cross sectional survey was applied targeting women attending the Obstetrics and Gynecology Departments to assess awareness, knowledge and practice towards cervical cancer and Pap smear among Saudi females.

This survey included 1116 women from Aseer Region, whose ages ranged from 18 to 58 years, with a mean age of 33.5 years. Only 36.6% heard about cancer cervix, and 24.3% knew about screening methods. Very few had good knowledge regarding cancer cervix. As for practice, only 27% underwent Pap smear, while

only 23.7% were advised to undergo Pap smear by their physicians. The authors concluded that Saudi females' knowledge regarding cancer cervix and its screening methods is poor. More attention should be paid to improve their knowledge and practice regarding cancer cervix prevention.

Hameed et al., reviewed data of reported 21626 personnel that investigated for HBsAg were retrieved from the Salahdeen health directorate covering a period of one year (2018). The authors stressed that Viral hepatitis gained little attention and funding from global health policymakers. Every year one million people die from viral hepatitis-related chronic consequences. Iraq; a country of intermediate endemicity for hepatitis B rates had been noted to increase with a stated prevalence rate of 1.6% among general population. The prevalence of HBsAg was 1.2%, males were affected more females, winter season carried more positive records of hepatitis B than other months of the year. Majority of HBsAg positive were between 15-45 age group, zero cases were recorded below 15 years of age. The authors concluded that monitoring the general population and subpopulation is a continuous process that is inclined in controlling hepatitis B, encouraging Hepatitis vaccination and promoting education about risky behaviors is quite needed.

Malik & Shaikh discussed the various type of monogenic diabetes. They stressed that there are various forms of monogenic diabetes and these include neonatal diabetes mellitus, maturity-onset diabetes of the young (MODY), mitochondrial diabetes, and rare diabetes-associated syndromic diseases. Single gene forms of diabetes represent an uncommon heterogeneous group of conditions mainly characterized by functional defects of pancreatic beta cells with consequential moderate to severe hyperglycemia. The body of the article focused mainly on MODY. The classic presentation of MODY includes nonketotic noninsulin-dependent diabetes with diagnosis before the age 25 and with an affected parent. According to various studies, there is a substantial number of individuals with a confirmed genetic diagnosis of MODY that do not fit the classic clinical description and approximately > 80% of MODY cases are not diagnosed by molecular testing.

Soliman, et al., report a case of ectopic pregnancy in patient with irregular menstrual bleeding. 33 years old female p3 +1 abortion known hyperthyroidism on Carbimazole, she was on IUCD (Intra Uterine Contraceptive Device) for 5 years then stopped it for more than 1 year trying to

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Perceptions of Patient Safety Culture among Physicians and Nurses in a Tertiary Hospital in Southwestern Saudi Arabia

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Abstract

Background: Patient safety has been one of the basic tenets of medicine and healthcare since the time of Hippocrates. The data regarding patient safety awareness among health care workers in southwestern Saudi Arabia is scarce.

Aim: To explore physicians and nurses' overall attitudes and perceptions towards patient safety culture and to evaluate any differences in their cultures.

Methodology: This cross-sectional study of a representative sample of physicians and nurses working in a tertiary hospital was conducted using a self-administered questionnaire developed by the Agency for Healthcare Research and Quality.

Results: The study included 369 participants. Their ages ranged from 18 to 60 years, with a mean age of 28.9 ± 8.5 years. The majority of participants were females (70.7%). The mean score for the overall patient safety grade was 72.3. The highest rated patient safety dimensions (scores over 70%) were "teamwork within units", "organizational learning-continuous improvement" and "feedback and communication about errors". On the other hand, the lowest dimensions (scores less than 50%) were "non-punitive responses to errors" and "Staffing". A statistically significant difference between physicians and nurses were found in 8 dimensions out of 12 dimensions of patient safety culture. The overall scores of the unit-level safety culture were significantly higher among nurses than among physicians (65.9% and 63.6%, respectively, $P=0.022$). Similarly, in the hospital-level safety culture, nurses had significantly higher safety culture scores than physicians (68.1% and 58.4%, respectively, $P=0.001$).

Conclusions: Nurses and physicians scored patient safety differently. Their perceptions regarding "teamwork within units", "organizational learning-continuous improvement" and "feedback and communication" were good. However, other patient safety dimensions need to be improved. Overall, nurses' perceptions are significantly better than physicians' perceptions. To improve healthcare delivery in the region, capacity-building programs should focus on improving the patient safety culture among health care providers, in general and with physicians in particular. Further studies are recommended among healthcare workers at other levels of healthcare in the region in order to improve patient safety practices.

Key words: Patient safety culture; Physicians; Nurses; Saudi Arabia

Background

Health-related behaviour in early life influences later risks for lifestyle-related disorders. It is therefore important to investigate health behaviors among young people. University students represent a major segment of the young adult population health-related behavior in early life influences later risks for lifestyle-related disorders. It is therefore important to investigate health behaviors among young people. University students represent a major segment of the young adult population.

World Health Organization (WHO) defines patient safety “as the absence of preventable harm to a patient during the process of health care” (1). Patient safety culture is one of the components of the healthcare organization’s culture which consists of shared values, attitudes, norms and pattern of behavior of employees regarding safety (2). Patient safety culture is enabled by different factors such as transparency of communication, leading by example, a commitment to continuous improvement, psychological safety which facilitates reporting of errors, and engagement of both patients and their families (3). An improved patient safety culture has been associated with reduced patient harm, perception of better care by patients (5) and family members (6), and reduced staff burnout (4-7). Researchers from Johns Hopkins University analyzed medical death rate data for a period of 8 years and found that deaths due to medical errors had increased to over 250,000 per year in the USA (8). A national survey from Saudi Arabia reported that the majority (70%) of the hospitals did not have a medication safety committee and only 9% had a medication safety officer(9). Two studies in Saudi Arabia estimated the prevalence of prescribing errors, in two governmental hospitals, to range between 13 and 56 per 100 medication orders (10-11).

It has been understood that medical errors can be due to systems failure and have become one of the most significant challenges for optimum healthcare provision. Patient safety can be improved by detecting inappropriate events that occur, learning from those events, and working toward preventing them (12). A recent study conducted in Saudi Arabia suggests building a program for transformational interference to promote patient safety culture (13). A study conducted in a medical city in Riyadh reported that regular assessment of hospitals helps to assess the changes in their performance and identify further areas of improvement (14).

There are many gaps in the knowledge of safety attitudes of health professionals among hospitals in Saudi Arabia and the data regarding patient safety awareness among health care workers in southwestern Saudi Arabia are scarce. Therefore, this study was undertaken with the purpose of exploring physicians and nurses’ overall attitudes towards patient safety culture in a tertiary health care hospital in southwestern Saudi Arabia.

Methodology

This cross-sectional study addressed awareness among physicians and nurses working at a tertiary hospital which is located in the southwestern part of the Kingdom of Saudi Arabia during the period from 2017 to 2019.

The study used the validated version of the “Surveys on Patient Safety Culture” (SOPS)(15), which is a self-administered questionnaire developed by the Agency for Healthcare Research and Quality (AHRQ). The SOPS was developed to evaluate the culture of patient safety in a healthcare facility. It contains 42 items and measures 14 dimensions. These 14 dimensions were organizational learning-continuous improvement, teamwork within units, hospital management support for patient safety, feedback and communication about errors, teamwork across hospital units, supervisor/manager expectations and actions promoting patient safety, frequency of events reported, overall perception of patient safety, hospital handoffs and transitions, communication openness, staffing, and non-punitive responses to errors. This tool has been previously used in many studies conducted worldwide, including Saudi Arabia 16-19. Permission for use of the tool was obtained from AHRQ. Ethical approval was obtained from the regional research ethics committee with REC # 2017-05-14. Informed consent was obtained from all the participants.

The target population was all physicians and nurses who were working at the tertiary hospital for at least six months, to ensure that they were familiar with the general running and administrative systems of the hospital.

For the scoring system used, the items’ positive score percent for each dimension (safety culture) were summed together, and the composite mean of positive percent scores for each dimension and total score were calculated; the composite positive score percent ranged from zero to 100% for all dimensions. Positive score percent was considered for the agreement answers in positive word items (positive statements) and for disagreement for negative word items (negative statements).

A minimal sample size of 360 medical staff (nurses and physicians) was calculated assuming that the average perception rate for patient safety culture was 50% with a 7% margin of error at the 95% confidence level with a design effect of 2. A stratified two-stage sampling method was used as the job title (physicians versus nurses). At the first stage, each member of the hospital department staff was stratified according to job title. At the second stage, a random sample from each stratum was included in the study using the proportional allocation technique. The questionnaires were distributed by hand.

Descriptive statistics included the mean with standard deviation for the composite positive score’s percentage of different dimensions and frequency and percent to describe the frequency of each category for categorical variables. Independent t-tests were used to test for differences

in the mean score percentage of different dimensions of safety and outcomes between the different health care facilities. Correlation analysis was used to test the nature and strength of the relation between safety culture dimensions and outcomes. All statistical analyses were performed using two-tailed tests, and an alpha error of 0.05. P values less than or equal to 0.05 were considered statistically significant. One-way ANOVA and independent t-test were used to test for differences at mean score % of different dimensions of safety and outcomes between the different professions. Chi square / Monte Carlo exact test and Fishers exact test were used to test for the differences at the health care staff characteristics between the different professions. Exact tests were used if there were small frequencies where chi square was invalid. Correlation was used to test the nature and strength of relation between safety culture dimensions and outcomes. The Pearson correlation coefficient (r) is expressed as the sign of the coefficient and indicates the nature of relation (positive / negative) while the value indicates the strength of relation.

Results

The study included 369 participants. Their ages ranged from 18 to 60 years, with a mean age of 28.9 ± 8.5 years. The study included 32.5% physicians, and the rest were nurses. The majority (70.7%) of the study participants were females. A higher proportion (45.5%) of the staff had working experience in the facility for 1-5 years, and 79.7% had worked for 40 hours or more weekly. A total of 74.6% of the sample had received training for safety measures. Arabic was the native language among 43.2% of the participants. (Table 1)

Most (7 out of 12) of the patient safety culture dimensions were significantly higher among nurses as compared to physicians. With regard to the unit level of safety culture, the following dimensions were significantly higher among nurses as compared to physicians: "organizational learning-continuous improvement", "communication openness", "feedback and communication about errors", and "non-punitive responses to errors". The overall unit-level safety culture score was significantly higher among nurses than among physicians ($P=0.022$). The highest rated dimensions (scores over 70%) were "organizational learning-continuous improvement", "teamwork within units", and "feedback and communication about errors". On the other hand, the less rated dimensions (60 - 70%) were "communication openness" and "supervisor expectations and actions promoting patient safety". The lowest rated dimensions (<60%) were "Staffing" and "non-punitive responses to errors". (Table 2)

The hospital-level safety culture dimensions were found significantly higher among nurses than physicians. The overall hospital-level safety culture score was significantly higher among nurses than among physicians ($P=0.001$). Regarding outcome assessment, only the frequency of events dimension was significantly higher among nurses than among physicians (73.6% vs 62.7%, respectively; $P=0.001$). (Table 2)

Regarding unit-level safety culture, all patient safety culture dimensions showed significant correlations with the following outcomes: overall perceptions of patient safety except for "staffing", with frequency of events reported except "non-punitive responses to errors" and with patient safety guide. The correlation coefficients ranged from -0.05 to 0.47. For hospital-level safety culture items, all items showed significant positive correlations with different outcome indicators except for handoffs and transitions. The correlation coefficients ranged from 0.04 to 0.44. (Table 3)

Table 1: Participant characteristics. N=369

Personal data		No	%
Gender	Male	108	29.3%
	Female	261	70.7%
Age	18-29	170	46.1%
	30-39	131	35.5%
	40-49	43	11.7%
	50-60	25	6.8%
Nationality	Saudi	162	43.9%
	Non-Saudi	207	56.1%
Position	Attending/Staff Physician	28	7.6%
	Resident or Specialist Physician	71	19.2%
	Consultant Physician	21	5.7%
	Nurse Aid or Practical Nurse	44	11.9%
	Registered Nurse	205	55.6%
Experience in facility	Less than 1 year	66	17.9%
	1-5	168	45.5%
	6-10	95	25.7%
	11 or above	40	10.8%
Experience in unit	Less than 1 year	82	22.2%
	1-5	190	51.5%
	6-10	67	18.2%
	11 or above	30	8.1%
Working hours per week	< 20 hours	25	6.8%
	20-40	50	13.5%
	41-60	250	68.1%
	60+	43	11.6%
Interaction with patients	Yes	350	94.9%
	No	19	5.1%
Experience	Less than 1 year	42	11.4%
	1-5	161	43.8%
	6-10	104	28.3%
	11 or above +	62	16.6%
Training	Yes	276	74.6%
	No	93	25.4%
Language	English	209	56.8%
	Arabic	160	43.2%

Table 2: Description of unit-level and hospital level safety culture dimensions with the outcome according to the healthcare professions. N=369

Domain	Dimensions	Overall		Profession				P
				Physician		Nurse		
		Mean%	SD	Mean%	SD%	Mean%	SD	
Unit-level safety culture	Supervisor/Manager Expectations and Actions	63.7	14.5	65.1	15.6	63	13.9	0.182
	Promoting Patient Safety	76.1	15.1	70.5	13.2	79	15.3	0.001*
	Organizational Learning-Continuous Improvement	75.8	15.8	75.9	13.8	75.8	16.8	0.944
	Teamwork Within Units	64.8	15.2	62.7	14	65.9	15.8	0.046*
	Communication Openness	71.1	17.9	63.7	16.8	74.8	17.4	0.001*
	Feedback and Communication About Errors	51.2	15.8	49.4	15	52.1	16.1	0.116
	Non-punitive Responses to Errors	54	11.1	56.1	11.2	53	10.9	0.011*
	Staffing	65.2	9.1	63.6	8.6	65.9	9.3	0.022*
	Unit-Level Safety Culture	70.7	15.3	63.9	16.5	74.1	13.4	0.001*
	Hospital-level safety culture	Management Support for Patient Safety	65	14	56.9	13.7	69.1	12.3
Teamwork Across Units		60.4	16	55.8	15	62.7	16.1	0.001*
Handoffs and Transitions		64.9	12.5	58.4	11.7	68.1	11.6	0.001*
Hospital-Level Safety Culture		66.7	12.1	67.2	12.9	66.5	11.7	0.637
Outcome	Perceptions of Patient Safety	69.9	19.7	62.7	20.6	73.6	18.1	0.001*
	Frequency of Events Reported	72.3	17	72.9	15.8	72	17.7	0.643

* P < 0.05 (Significant)

Table 3: Correlation between patient safety and outcome dimensions. N=369

Factor	Patient safety culture dimensions	Correlation coefficient	Outcome		
			Overall Perceptions of Patient Safety	Frequency of Events Reported	Patient Safety Grade
Unit-level safety culture	Supervisor/Manager Expectations and Actions Promoting Patient Safety	r P	0.32 .001*	0.21 .001*	0.36 .001*
	Organizational Learning-Continuous Improvement	r P	0.27 .001*	0.40 .001*	0.34 .001*
	Teamwork Within Units	r P	0.32 .001*	0.29 .001*	0.34 .001*
	Communication Openness	r P	0.11 .001*	0.30 .001*	0.16 .001*
	Feedback and Communication About Errors	r P	0.32 .001*	0.47 .001*	0.39 .001*
	Non-punitive Responses to Errors	r P	0.15 .001*	-0.05 .372	0.11 .005*
	Staffing	r P	0.05 .162	0.12 .001*	0.11 .002*
Hospital-level safety culture	Management Support for Patient Safety	r P	0.44 .001*	0.24 .001*	0.39 .001*
	Teamwork Across Units	r P	0.30 .001*	0.18 .001*	0.29 .001*
	Handoffs and Transitions	r P	0.34 .001*	0.04 .309	0.25 .001*

Discussion

In the present study, the overall mean percentage scores for the seven unit-level safety culture dimensions ranged from 51.2% for “non-punitive responses to errors” to 76.1% for “organizational learning-continuous improvement”. The highest rated dimensions (scores over 70%) were “organizational learning-continuous improvement”, “teamwork within units” and “feedback and communication about errors”. These results are consistent with those in Riyadh, Saudi Arabia, (20) and in Kuwait (21). This finding shows that most physicians and nurses ‘agreed’ or ‘strongly agreed’ that people supported one another within the unit during times of urgent and high workloads and treated each other with respect. Most participants also ‘agreed’ or ‘strongly agreed’ that their organization was actively functioning towards ensuring patient safety and continuously evaluating and improving the effectiveness of their patient safety standards. Furthermore, most participants also ‘agreed’ or ‘strongly agreed’ that they had an efficient system of feedback and communication about errors and that they took steps to prevent the repetition of errors to ensure patient safety. A systematic review on studies from the Arab states regarding Hospital Survey on Patient Safety Culture by Elmontsri et al

concluded that overall teamwork within units was better than teamwork across hospital units. Organizational learning and continuous improvement were found to be satisfactory, the average score of this dimension was 73.2% (22). Staffing, non-punitive response to errors, organizational learning improvement, feedback about the error, and teamwork were also identified as the areas of strength in another study in Arar city, Saudi Arabia (23).

The lesser rated dimensions included “communication openness” and “supervisor expectations and actions promoting patient safety”, and the lowest rated dimensions were “staffing” and “non-punitive responses to errors”. For the latter two dimensions, scores were 54.6% and 50.8%, respectively, suggesting that only half of the participants ‘agreed’ or ‘strongly agreed’ with the positive items. These findings are consistent with those of the researchers who studied hospitals in Makkah, Saudi Arabia,(24) who also found that “staffing” and “non-punitive responses to errors” were two dimensions that needed improvement in Saudi hospitals. Moreover, the review by Elmontsri et al also concluded that communication openness was a concerning issue for healthcare professionals in the Arab world (25). Communication openness was identified as

the area for improvement by other studies conducted in Saudi Arabia (17, 20, 25).

When the three hospital-level safety culture dimensions were considered, the scores were highest for “management support for patient safety”, followed by “teamwork across units”, and “handoffs and transitions”. Most participants ‘agreed’ or ‘strongly agreed’ that hospital management was interested in promoting a climate of patient safety and that this was a top priority for the organization. Furthermore, most participants ‘disagreed’ that their management was interested in patient safety only after an event had occurred. Most participants also perceived that there was good cooperation and coordination among hospital units with the goal of providing the best possible patient care. Finally, most participants also felt that “handoffs and transitions” occurred quite smoothly without compromising patient safety. Similar results were reported in Riyadh, Saudi Arabia (20). On the contrary, in another study conducted among nurses in Saudi Arabia, six areas of patient safety were identified as weaknesses, namely “overall perception of patient safety”, “handoffs and transitions”, “communication openness”, “staffing”, “frequency of events reported”, and “non-punitive response to errors” (26).

Participants also had high positive scores for patient safety outcomes (patient safety grade, frequency of events reported, and overall perceptions of patient safety). These results are consistent with those of a previous study wherein overall patient safety grade for the hospital was considered as an outcome variable (12). On the contrary, another study from Saudi Arabia by Alzahrani et al observed that safety attitudes of doctors and nurses working in emergency departments are less than positive and correlate with the number of reported errors (27).

For the present study, a significant correlation existed between the unit- and hospital-level patient safety dimensions of the SOPS and its outcomes. The results of the present study suggest that the overall perception of patient safety is predicted by nine out of the ten patient safety culture dimensions (except “staffing”). Furthermore, the frequency of events reported is significantly associated with all dimensions except “transitions and handoffs” and non-punitive responses to errors. Finally, patient safety grade is associated with all dimensions significantly. Management support for patient safety improves the patient safety culture (23,28). The hospital leaders should evaluate employees’ perceptions and feelings through interviews, discussions and surveys. Such evaluations will guide changes to policies and resource allocation which may improve managers’ support for patient safety (29).

The study population included only physicians and nurses. Including other healthcare professionals such as health managers, pharmacists and other members of the healthcare community could have improved study generalizability. Larger samples and using other recruitment strategies should be considered in future safety culture studies in the region. In addition, the findings of this hospital-based study can only be seen as an indication about patient safety culture in such settings.

However, the results of this study do provide insights for secondary care practices which can be applied following further studies on this topic.

Conclusions and Recommendations

The study indicated that nurses and physicians’ perceptions regarding “teamwork within units” and “organizational learning-continuous improvement” were good in their healthcare facility, but other dimensions such as “communication openness”, “supervisor expectations promoting patient safety”, “staffing”, and “non-punitive responses to errors” should be improved. Overall, nurses’ perceptions were significantly better than physicians’ perceptions. To improve health care delivery in the region, capacity-building programs should stress improving patient’s safety cultures among health care providers in general and physicians in particular. Further studies are recommended among health care workers in the region at other levels of health care, including primary and secondary levels, to evaluate safety culture among them.

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Awareness, Knowledge and Practice of Adult Saudi Females about Cervical Cancer Screening, in Aseer Region, Saudi Arabia

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Abstract

Background: Cervical cancer is the fourth most common female cancer. Lack of knowledge and poor attitude towards the disease and risk factors can affect screening practice and development of preventive behavior for cervical cancer. It accounts for 2.6% of all newly diagnosed cancers in Saudi females.

Aim: To assess awareness, knowledge and practice towards cervical cancer and Pap smear among Saudi females in Aseer Region, Saudi Arabia.

Methodology: A descriptive cross sectional survey was applied targeting women attending the Obstetrics and Gynecology Departments in Aseer Region. Data were collected using a pre-structured direct interview questionnaire. Awareness and knowledge were assessed using seven questions with one single correct answer for each. Practice regarding Pap smear was assessed using three questions.

Results: This survey included 1116 women from Aseer Region, whose ages ranged from 18 to 58 years, with a mean age of 33.5 years. Only 36.6% had heard about cancer of the cervix, and 24.3% knew about screening methods. Very few had good knowledge regarding cancer of the cervix.

As for practice, only 27% underwent Pap smear, while only 23.7% were advised to undergo Pap smear by their physicians.

Conclusions: Saudi females' knowledge regarding cancer of the cervix and its screening methods is poor. More attention should be paid to improve their knowledge and practice regarding cervical cancer prevention.

Key words: Cancer of the cervix, Pap smear, Human papilloma virus, awareness, screening, Saudi Arabia.

Introduction

Cervical cancer is the fourth most common cancer in women. In 2018, an estimated 570,000 women were diagnosed with cervical cancer worldwide and about 311,000 women died from the disease (1). A significant drop in its incidence has been reported in developed countries as a result of intensive cervical screening programs (2,3).

Most women with cervical cancer experience a long asymptomatic period before the disease becomes clinically evident. Therefore, early recognition of abnormal cytologic changes through regular screening may prevent progression from pre-invasive to invasive disease. But later on, symptoms may include abnormal vaginal bleeding, pelvic pain or pain during sexual contact (4).

Almost all cervical cancer cases (99%) are linked to infection with high-risk human papilloma virus (HPV), an extremely common virus transmitted through sexual contact (1). This link is strongest for certain HPV types, particularly types 16 and 18 (4). Although most infections with HPV resolve spontaneously and cause no symptoms, persistent infection can cause cervical cancer in women (1).

There are other risk factors for cancer of the cervix including smoking, parity, immunosuppression, starting sex at a young age, but these are less important. The progression from high grade lesion to invasive cancer takes approximately 8 to 12 years (5). Squamous cell carcinomas is the most frequent cancer type (80% to 85%), while 15%-20% are adenocarcinoma (6). Diagnosis is typically by cervical screening followed by a colposcopy and biopsy. Pap smear is universally recommended for all sexually active women (7).

Clinical trials and post-marketing surveillance have shown that HPV vaccines are very safe and very effective in preventing infections with HPV infections. HPV vaccines work best if administered prior to exposure to HPV. Therefore, the WHO recommends to vaccinate girls, aged between 9 and 14 years, when most have not started sexual activity. HPV vaccination does not replace cervical cancer screening (1).

In Saudi Arabia, cervical cancer is ranked the ninth most common cancer in Saudi females. Moreover, it comprises approximately 2.6% of all newly diagnosed cancers in Saudi females (8). Although cervical cancer screening has been upgraded in Saudi Arabia, not all females, especially those at risk, have good awareness regarding it (9). Also the number of females who seek to undergo Pap smear or have been vaccinated against HPV is still unsatisfactory due to their lack of knowledge and negative attitude (9, 10).

This study aimed to assess knowledge and practices of Saudi females in the Southwestern Region of Saudi Arabia regarding cervical cancer and its screening methods.

Methodology

A descriptive cross-sectional survey was applied targeting women attending the Obstetrics & Gynecology departments and also outpatient clinics or inpatient wards in the governmental hospitals in Abha City, Saudi Arabia. Abha City is the capital of Aseer Region, at the Southwestern part of Saudi Arabia, where the main tertiary care hospitals exist.

Data were collected using a pre-structured direct interview questionnaire. The questionnaire was developed by the researchers after intensive literature review and experts consultation. The questionnaire included a section for women's personal data, including age, educational level, marital status, work and parity. Awareness was assessed by seven questions, with one single correct answer for each. Questions covered overall awareness, screening methods, proper age to do a Pap smear and to stop doing it, and the HPV vaccine. Practice regarding Pap smear was assessed using three questions. The data collection tool was validated based on experts' opinion. Internal consistency was assessed by Cronbach's alpha coefficient (0.83). A pilot study was conducted, and test-retest reliability coefficient was 0.72.

Collected data were revised, coded and fed into a computer using the Statistical Package for Social Sciences (IBM, SPSS version 22). All statistical analyses were done using two-tailed tests and alpha error of 0.05. P-values less than 0.05 were considered as statistically significant.

Awareness/knowledge level was assessed after scoring the correct answers by "one point" or "zero" point for all incorrect answers. All discrete scores for the awareness items were summed together and the overall score was categorized into either "poor" for those who had scores less than 60% of the maximum (score range was 0-7 points), or "good" for those with scores of 60% or more. Descriptive statistics were calculated for all variables including awareness and practice items. Univariate relations between the females' bio-demographic characteristics and their awareness were tested using Pearson's Chi-square (χ^2) test.

Results

The survey included 1,116 women from Aseer region whose ages ranged from 18 to 58 years, with a mean age of 33.5 ± 8.9 years. More than three-quarters of participants (77.9%) were married. University education was reported for 73.4%, 46.1% were working, while 77.1% had 1-5 children (Table 1).

As for awareness regarding Pap smear (Table 2), 36.6% of the participants had heard about cancer of the cervix, 24.3% know about screening methods for cancer cervix, 17.2% identified the proper time for a PAP smear, and only 5.6% correctly detected age to stop doing PAP smear. A total of 118 (10.6%) had good awareness level about cancer of the cervix.

Regarding participants' sources of knowledge (Figure 1), books and social media were the most common sources (15.4%), followed by physicians (6.6%), study (0.9%), while 75.7% had no specific source.

Considering practice regarding Pap smear, Figure 2 demonstrates that 27% of participants previously underwent Pap smear, while 23.7% were advised to have a Pap smear by their physicians and 9.9% asked their physicians to do it.

Finally, on relating females' awareness level with their personal data, 17.4% of single females had good awareness level regarding cancer of the cervix compared to 5.3% of divorced or widowed participants ($P=0.002$). Also 12.7% of university graduated females had good awareness level compared to 3.2% of those with lower educational level ($P=0.001$). Considering parity, good awareness level was recorded among 12.2% of females with 1-3 children, compared to 14.3% of nulliparous females ($P=0.004$). Also 15.2% of employed females had a good awareness level compared to 6.6% of those unemployed ($P=0.001$). About 16% of females who underwent Pap smear had good awareness level compared to 8.7% of those who did not ($P=0.001$), as shown in Table 3 (page 18).

Table 1: Personal characteristics of participant females in Aseer Region, Saudi Arabia

Personal data	No	%	
Age (in years)	< 20 years	22	2.0
	20-29	323	28.9
	30-49	710	63.6
	50+	61	5.5
Marital status	Single	190	17.0
	Married	869	77.9
	Divorced/widow	57	5.1
Education	Below secondary	62	5.6
	Secondary	235	21.1
	University	819	73.4
Work	Unemployed	602	53.9
	Employed	514	46.1
Parity	Nullipara	280	25.1
	1-3	435	39.0
	4-5	279	25.0
	6+	122	10.9

Table 2: Participants' awareness and knowledge regarding cervical cancer screening in Aseer Region, Saudi Arabia

Awareness/knowledge items	Correct answer	
	No.	%
Heard about cancer of the cervix	409	36.6
Know about vaccines for HPV	137	12.3
Know about screening methods for cancer of the cervix	271	24.3
Proper time for PAP smear	192	17.2
Frequency of PAP smear	78	7.0
Age to stop doing PAP smear	62	5.6
Difference between PAP smear and vaginal swab	190	17.0

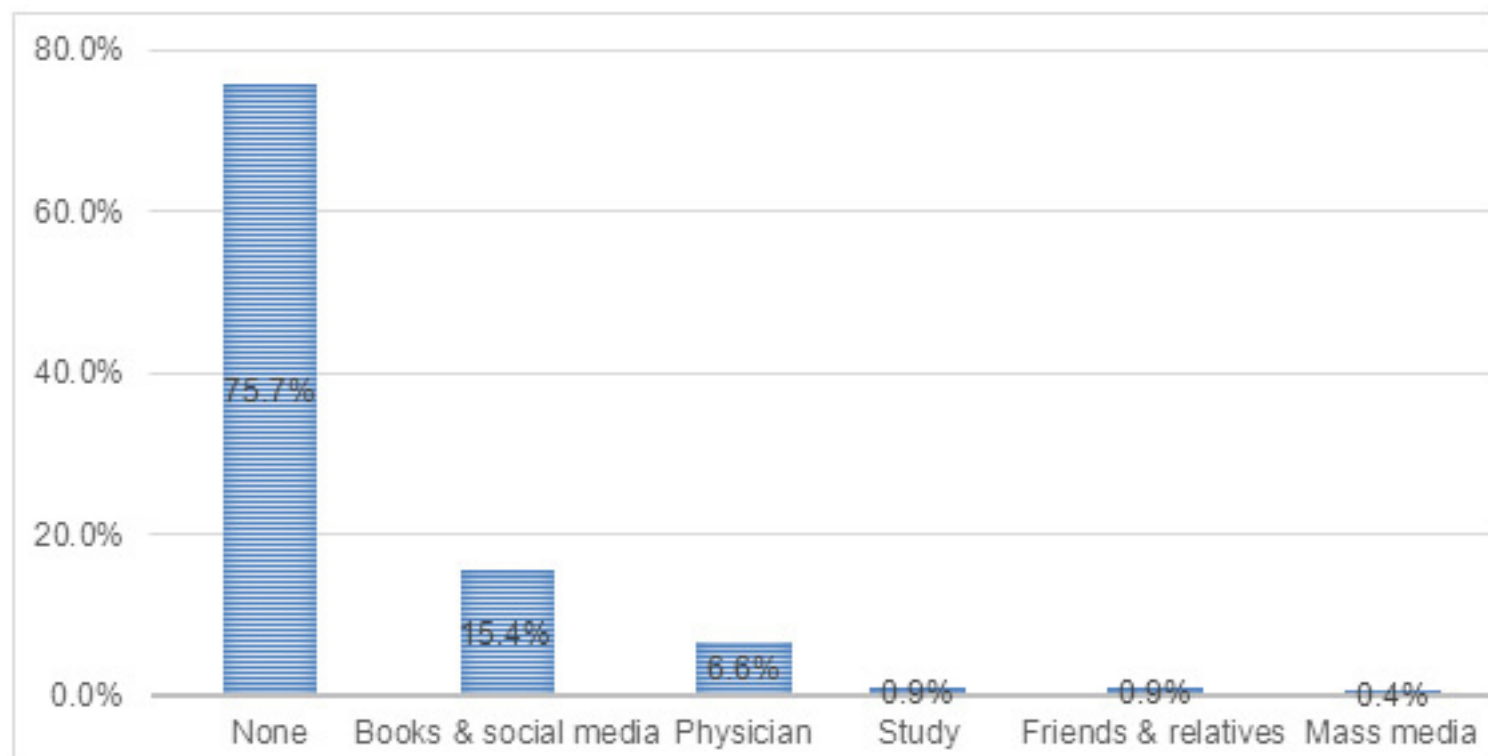
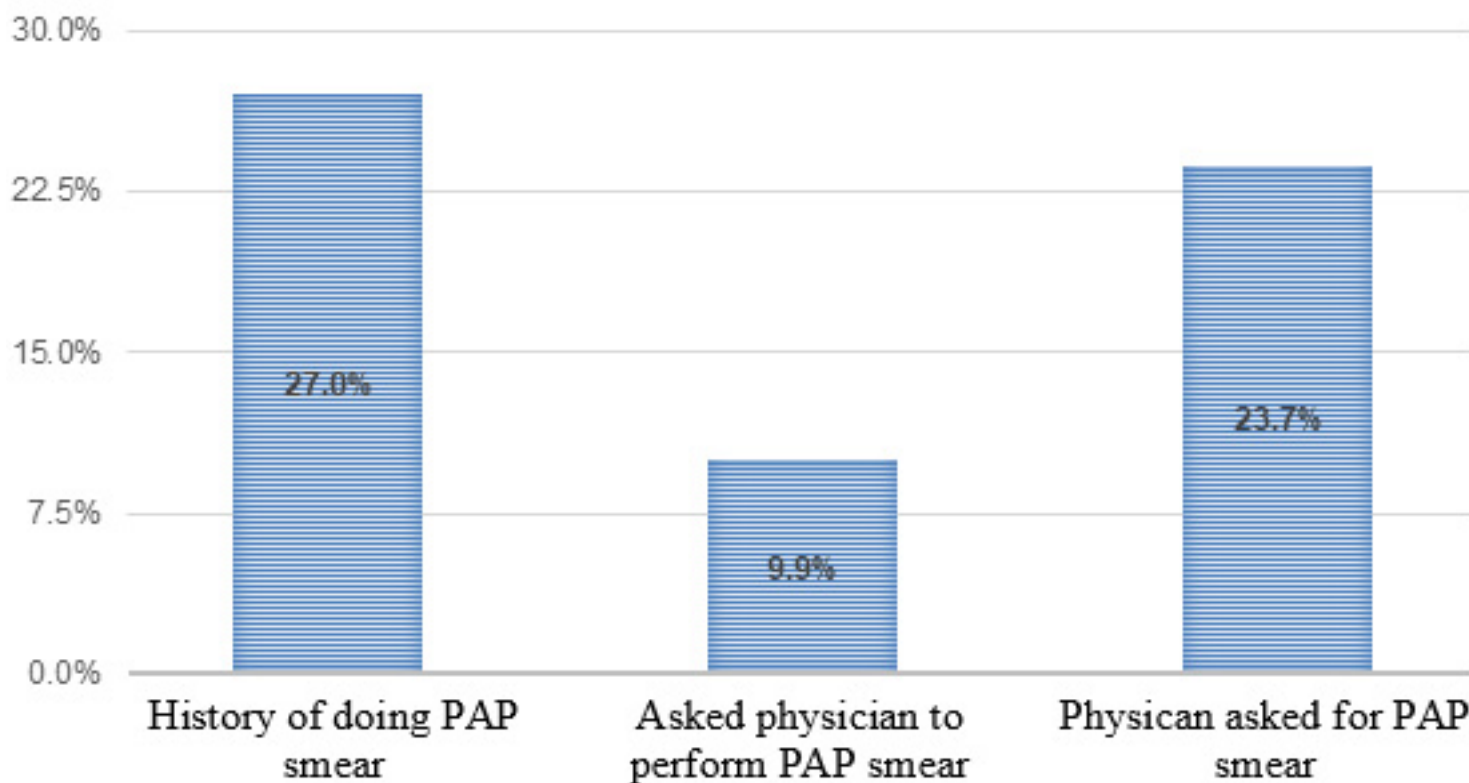
Figure 1: Sources of knowledge regarding cervical cancer screening among women in Aseer Region, Saudi Arabia

Figure 2: Performing Pap smear by women in Aseer Region, Saudi Arabia

Discussion

Cervical cancer is a preventable gynecological disease. An essential component of its prevention is the early identification of premalignant lesions by Pap smear (2). Nevertheless, more than 40% of women having cervical cancer are diagnosed at advanced stages in Saudi Arabia, compared to 25% in British, Columbia and Canada. The delay in diagnosis among Saudi women is mainly attributed to the lack of effective prevention and screening programs (13,14).

Healthcare staff examine women attending healthcare facilities for various obstetric/gynecologic reasons and may ask them to undergo Pap smear as a screening test for early detection of cervical cancer. The incidence of cancer of the cervix was dramatically reduced in the developed countries over the last few years due to better awareness and screening practices. In addition, the HPV vaccine proved to offer a significant role in reducing the incidence rate of cervical cancer (6,8).

In Saudi Arabia, there are limited studies that explore awareness, knowledge, and practices of women toward Pap smear. No study has been conducted in the southern area of the Kingdom, as most studies were conducted in the capital city (Riyadh) and one study in Al-Ahsa City that involved only medical students (8, 9, 11, 15).

The current survey aimed to assess knowledge and practice of the Saudi females in Aseer Region regarding cancer of the cervix. Findings revealed that only one out of each ten women had good knowledge level regarding cervical cancer. The best areas of knowledge were its screening methods, proper time for performing Pap smear, and the ability to differentiate between Pap smear and vaginal swab. On the

other hand, areas of knowledge defect were the proper age and frequency of undergoing Pap smear.

Significant predictors for good knowledge included university educated females, at young age, who had children and previously did Pap smear. Social media and physicians were the most common sources for participants' knowledge about cervical cancer.

Regarding practices, the present study revealed that almost one out of each four females (23.7%) underwent Pap smear which, was due to the request from their physician.

Raising awareness and knowledge about cervical cancer has a crucial role in disease prevention. HPV vaccination and proper screening can significantly minimize the burden of the disease to a great extent (8-12). Early detection of precancerous pathologies can be achieved by cervical cytology examination of smears (Pap test), as the main screening test. Cytology from the transformation zone of the cervix where squamous cells from the outer opening of the cervix and glandular cells from the endocervical canal join is the site for most of the cervical abnormalities and cancers (16).

In Saudi Arabia, Al-Shaikh et al. assessed knowledge of Saudi female health colleges' students regarding cervical cancer and their acceptance of HPV vaccine (11). They reported that 95.7% of students had poor knowledge level. The Pap smear was poorly recognized as a screening tool, with only 46.7% of students having heard of the test. Another study was conducted to evaluate the level of awareness about cervical cancer, Pap smear test and HPV among women in Saudi Arabia (12). Its findings revealed that the overall knowledge

Table 3. Participants' awareness and knowledge regarding cervical cancer screening according to their personal characteristics, Aseer Region, Saudi Arabia

Personal characteristics	Awareness/knowledge level				P-value	
	Poor (n=998)		Good (n=118)			
	No.	%	No.	%		
Age in years	< 20 years	20	90.9	2	9.1	0.130
	20-29	281	87.0	42	13.0	
	30-49	638	89.9	72	10.1	
	50+	59	96.7	2	3.3	
Marital status	Single	157	82.6	33	17.4	0.002*
	Married	787	90.6	82	9.4	
	Divorced/ widow	54	94.7	3	5.3	
Education	Below secondary	60	96.8	2	3.2	0.001*
	Secondary	223	94.9	12	5.1	
	University	715	87.3	104	12.7	
Work	No	562	93.4	40	6.6	0.001*
	Yes	436	84.8	78	15.2	
Parity	Nullipara	240	85.7	40	14.3	0.004*
	1-3	382	87.8	53	12.2	
	4-5	260	93.2	19	6.8	
	6+	116	95.1	6	4.9	
History of Pap smear	No	744	91.3	71	8.7	0.001*
	Yes	254	84.4	47	15.6	

P: Pearson X2 test

* P < 0.05 (significant)

level regarding cervical cancer was good (78.6%), but was low regarding HPV and Pap smear screening method (16.4%, and 35.9%, respectively).

Generally, it is important to raise females' awareness regarding cancer of the cervix and its early detection by screening. This importance emerges from the fact that cervical cancer is mainly caused by a preventable agent, namely, HPV. Therefore, improving awareness, attitude and screening practices is expected to reduce the burden on the individual and community levels (17).

In conclusion, this study revealed that Saudi females' awareness and knowledge regarding cervical cancer and its screening methods were quite poor. Also screening practices were minimal and mainly based on physician's advice. More attention should be paid to raise women's awareness and improve their practices regarding cervical cancer screening. This can be applied through enforcing the health education role played by physicians in primary healthcare facilities toward mothers who escort their children for vaccinations. Moreover, female university students constitute an important target regarding health education about prevention of cancer cervix. Simple educational posters at healthcare facilities can help transmit important information messages to the public regarding prevention of cancer cervix.

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Public awareness and attitude of the population of Al-Madinah Al-Munawwarah regarding the effects of sunlight and food on vitamin D homeostasis: A cross-sectional study

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Abstract

Objectives: This is a cross-sectional study aiming at assessing the public awareness regarding the effects of food and sunlight on vitamin D homeostasis in Al-Madinah Al-Munawwarah, Saudi Arabia.

Methods: An electronic validated questionnaire from previously published research was distributed through an online link to the targeted population. The study recruited 790 participants. The questionnaire was directed to Al-Madinah Al-Munawwarah population including all people who are above 15 years of age. We excluded any response from outside Al-Madinah Al-Munawwarah and from children less than 15 years old. All data analyses were carried out using Statistical Packages for Social Sciences (SPSS) version 20.

Results: We found that 91% of the participants (n=719) had sufficient knowledge about vitamin D. The majority of participants (87.5%, n=620) correctly identified 7–9 AM as the best time for sun exposure. Participants working in health fields had more knowledge ($p < 0.001$) regarding vitamin D compared to other specialties. High atmospheric temperature causes low participant' exposure to

sunlight followed by absence of appropriate places and lack of suitable time. We found that 47.6% (n=367) of participants are taking vitamin D supplements with females as a majority (62.8%) (n=267) vs (29.9%) (n=109) for males. Females' clothes cause less exposure to sunlight 38.4% (n=150). Participants in the healthcare fields (48.9%, n=170) are staying more in the sunlight for 15 minutes duration. ($p = 0.016$).

Conclusion: It is recommended to increase the number of outdoor walking sites. Awareness level and health education regarding vitamin D need to be improved in the population of Al-Madinah Al-Munawwarah.

Key words: Awareness, deficiency, dietary supplements, sunlight, vitamin D.

Introduction

Vitamin D is a fat-soluble prohormone produced endogenously in the skin after exposure to sunlight. Following exposure to ultraviolet light, vitamin D precursor (7-dehydrocholesterol) is converted to inactive vitamin D (cholecalciferol) then the active form (Calcitriol) is formed [1]. Exposure to ultraviolet rays of sunlight is the main source of vitamin D. Vitamin D produced in the skin after exposure to sunlight lasts longer in the blood than vitamin D from dietary sources [2]. Vitamin D affects bone homeostasis. That may closely affect orthopedics practice and musculoskeletal surgery outcomes.

The main natural vitamin D source is synthesis by the skin during exposure to sunlight (exposure to ultraviolet B rays) [3]. Exposing face, arms and legs for a period of time can satisfy the body's vitamin D requirement while minimizing sunlight-induced skin damage [4].

The most common exposure time to sunlight in Saudi Arabia was reported to be between 8:00 AM to 4:00 PM and peaked during 10:00 AM to 12:00 PM in both summer and winter. For fear of UV ray exposure-induced risk of cancer during the period between 10 AM to 12 PM, patients should be advised to be exposed to the sun between 8:00 AM to 10:00 AM and 1:00 PM to 3:00 PM [5,6]. Adequate duration to get sufficient amount of vitamin D through skin exposure to sunlight is 10–30 minutes (3 times/week) for a white-skinned population. Dark skinned people need

longer duration of sunlight exposure because darker skin has less efficient vitamin D production due to high melanin pigmentation, which acts as a natural sunscreen. This greatly reduces ultraviolet B rays exposure. Vitamin D deficiency is a global public health problem in all age groups that is usually unrecognized by the public. Vitamin D is deficient in several countries and is particularly more deficient in patients in the Middle East [7-8]. A recent meta-analysis study including 20,787 patients reported that the prevalence of vitamin D deficiency among males and females was 63.5% [9]. Moreover, prevalence of vitamin D deficiency was significantly greater in females (34.8%) compared to only 13.4% among the males [10]. Regarding public awareness of vitamin D deficiency in Najran (Saudi Arabia), 11% of the investigated participants had no idea about vitamin D [7]. Regarding awareness of vitamin D deficiency in Jeddah, 1,145 out of 1,752 participants had some idea about foods rich in vitamin D [11]. Regarding the awareness and attitude towards vitamin D deficiency, 28% of participants were aware of vitamin D sources and 50% knew about its benefits. This needs improving people's knowledge and awareness. There is a significant association between the level of vitamin D knowledge and educational level [12].

More health education is needed regarding the dietary sources and established health benefits of vitamin D for muscles, bones, and the immune system. Social workers and non-governmental organizations may work together with governmental healthcare organizations to teach

children and parents about the uses and benefits of vitamin D [13]. Similarly, many people in Al-Madinah Al-Munawwarah have a knowledge gap regarding vitamin D due to many causes e.g. unhealthy lifestyle and lack of knowledge and orientation about vitamin D deficiency and its complications. Unfortunately, there is no current health program able to orient people about vitamin D deficiency and the role of primary health care in raising people's awareness regarding vitamin D deficiency [14]. Furthermore, there is a need to conduct interventions and qualitative studies to assess the level of awareness regarding vitamin D deficiency, to determine the underlying reasons for poor vitamin D level and to fill the knowledge gaps. All of these measures will help to improve vitamin D status and the health problems related to its deficiency or toxicity among Al-Madinah Al-Munawwarah people. Till now, there is no report regarding awareness of the society of Al-Madinah Al-Munawwarah regarding vitamin D deficiency, sources, and complications.

This study aims at measuring the public awareness of vitamin D deficiency in Al-Madinah Al-Munawwarah society and the participants' attitudes towards it. This could be regarded as a cornerstone in the future plans to solve this problem. This cross-sectional study aims at assessing public awareness and attitude regarding the effects of food and sunlight on vitamin D homeostasis in Al-Madinah Al-Munawwarah may closely affect orthopedic practice and musculoskeletal surgery outcomes. This study also consolidates the results regarding public awareness of vitamin D medicine, seals the gap of knowledge seen in Al-Madinah Al-Munawwarah population, and assesses the awareness of the relationship between sun exposure and vitamin D deficiency in Al-Madinah Al-Munawwarah society.

Materials and Methods

- This is a cross-sectional prospective study that was conducted in Al-Madinah Al-Munawwarah, Saudi Arabia from 25th November 2018 to 1st of October 2019. An electronic questionnaire was used to collect data. Validated questionnaires from previously published research were distributed through an online link to the targeted population. Participants' confidentiality was guaranteed. Participation was optional with full participants' right to participate or not. Data was collected randomly using an online questionnaire (Google forms) that was designed to collect the information using self-reported and direct knowledge questions about vitamin D medicine. The questionnaire was uploaded to social media. Target population was the population of Al-Madinah Al-Munawwarah (about 1,152,991) based on the data of the general census of the population and housing (2010) [25]. Sample size was calculated to be 666 with 99% confidence level. We collected 942 responses. The questionnaire was directed to Al-Madinah Al-Munawwarah population including all people who were above 15 years of age. We excluded any response from outside Al-Madinah Al-Munawwarah and from children less than 15 years old. 786 responses were gained. The questions were multiple choice questions. Al-Madinah Al-Munawwarah population

were invited to participate in the questionnaire that included socio-demographic characteristics like gender, educational level, house type and monthly income. The questions also asked if people have a history of vitamin D deficiency or had heard about it.

The questionnaire also asked about:

- The benefits of sun exposure, which parts of the body should be exposed, the best time for the exposure, and duration of exposure.

- The amount of daily needs of vitamin D that we get from the sun, the reasons behind lacking sun exposure and which age group have more risk for vitamin D deficiency.

- Vitamin D sources and their background about what foods are rich in vitamin D and what is their importance for their health.

- Role of primary health care regarding awareness of vitamin D deficiency, and what are their sources of information.

Then we applied the mentioned exclusion criteria to the data. Descriptive statistics were presented as numbers and percentages. Statistical analysis was done using chi square test. $p < 0.05$ was considered statistically significant. All data analyses were carried out using Statistical Packages for Social Sciences (SPSS) version 20, (Armonk, NY: IBM Corp). Consent was obtained from all the participants after describing the aim of the study. Privacy and confidentiality were assured.

Results

Female participants had significantly more knowledge about vitamin D. Furthermore, participants working in the health field had more significant knowledge ($p < 0.001$) regarding vitamin D compared to those in other occupations. In contrast, house style ($p = 0.271$), educational level ($p = 0.079$) and monthly income ($p = 0.778$) had no significant relationship with the knowledge about vitamin D [Table 1].

Characteristics of the participants regarding exposure to ultraviolet rays of sunlight are described in Table 2. According to our data [Table 2], 58% of the participants ($n = 458$) had exposure to sunlight with males (80%, $n = 293$) having more exposure to sunlight compared to females (38.8%, $n = 165$) ($p < 0.001$). The most common duration of sunlight exposure to get vitamin D was 15 minutes (45.8%, $n = 362$) with females having more significant exposure time to sunlight for 15 minutes duration ($p < 0.001$). With regard to the best time for sun exposure, a high proportion of participants (78.5%, $n = 620$) correctly identified 7–9 AM ($p = 0.548$) while 34.2% ($n = 270$) chose 3–5 PM ($p = 0.001$) as the best time for sun exposure. However, 13.4% ($n = 106$) of them incorrectly identified 10 AM–3 PM ($p = 0.672$) as the best time for sun exposure. Regarding the body parts that should be exposed to sunlight, 22.5% ($n = 178$) of them correctly identified hands, arms, face and legs ($p < 0.001$). The majority of the participants (95.6%, $n = 755$) indicated breastfeeding as the appropriate source of vitamin D ($p = 0.526$) with 47.6% ($n = 367$) taking vitamin D as a supplement. The majority of females (62.8%, $n = 267$) had a significant usage of vitamin D supplements ($p < 0.001$)

Table 1: Relationship between the knowledge about vitamin D and the socio-demographic characteristics of participants (n=790)

Factor	Knowledge about Vitamin D		p value §
	Yes N (%) (n=719)	No N (%) (n=71)	
Age group in years			
• 15 – 20 years	148 (20.6%)	17 (23.9%)	0.004 **
• 21 – 25 years	323 (44.9%)	16 (22.5%)	
• 26 – 35 years	179 (24.9%)	26 (36.6%)	
• 36 – 45 years	41 (05.7%)	06 (08.5%)	
• >45 years	28 (03.9%)	06 (08.5%)	
Gender			
• Male	314 (43.7%)	51 (71.8%)	<0.001 ***
• Female	405 (56.3%)	20 (28.2%)	
Housetype			
• Mud house	28 (03.9%)	02 (02.8%)	0.271
• Apartment	436 (60.6%)	50 (70.4%)	
• Villa	255 (35.5%)	19 (26.8%)	
Educational level			
• Secondary or below	166 (23.1%)	23 (32.4%)	0.079
• University or more	553 (76.9%)	48 (67.6%)	
Type of job			
• Work in a health-field	31 (04.3%)	02 (02.8%)	<0.001 ***
• Work outside health-field	135 (18.8%)	20 (28.2%)	
• Health-field student	308 (42.8%)	07 (09.9%)	
• Non-health-field student	96 (13.4%)	14 (19.7%)	
• Not working	149 (20.7%)	28 (39.4%)	
Monthly income level (SAR)			
• <3,000	359 (49.9%)	38 (53.5%)	0.778
• 3,000 – 5,000	77 (10.7%)	08 (11.3%)	
• 5,001 – 10,000	101 (14.0%)	11 (15.5%)	
• >10,000	182 (25.3%)	14 (19.7%)	

§ p value has been calculated using chi square test.

* Significance was set at p<0.05 level.

among whom 68.5% (n=183) were taking vitamin D as prescribed by their physician ($p<0.001$). The most common reason for receiving vitamin D prescription was body pain (19.5%, n=47) followed by vitamin D deficiency (10.8%, n=26). On the other hand, only 31.1% of the participants (n=246) were given advice by the primary health care physician regarding the importance of vitamin D ($p<0.001$) with only 10.9% of them (n=86) having attended a health education seminar about symptoms of vitamin D deficiency as organized by a primary health care center ($p=0.123$) [Table 2].

In Table 3, participants in the healthcare fields (48.9%, n=170) are staying more significantly in the sunlight in a 15 minutes duration to obtain vitamin D ($p=0.016$). The best time for sun exposure was in the period between 10–3 PM ($p=0.030$) and 3–5 PM ($p=0.002$). Both were statistically significant in relation to specialty ($p<0.001$). Body parts that should be exposed to sunlight were also found to have a significant relationship with specialty. On the other hand, non-healthcare participants (93.1%, n=324) were significantly higher in utilizing breastfeeding practices ($p=0.003$) while healthcare respondents (51.6%, n=83) significantly needed advice for vitamin D intake ($p<0.001$). In contrast, exposure to sunlight ($p=0.075$), taking vitamin D as a supplement ($p=0.095$), prescribing vitamin D ($p=0.067$) and attending health education seminar about symptoms of vitamin D deficiency ($p=0.113$) were all not statistically significant in relation to specialty [Table 3].

Figure 1 explored the reasons for avoiding sunlight exposure. The most commonly known reasons were the high temperature (60.8%) and no place for sunlight exposure (37.7%) while the least of them was sun allergy (6.3%).

In Figure 3, the relationships between gender and the reason to avoid sun exposure were shown. The most common reason to avoid sun exposure among males and females was “high sun temperature” (62.5% vs 60.4%) followed by “having no time” (38.9% vs 36.9%). When comparing the gender in relation to the reason to avoid sun exposure, we found that “no place” ($p=0.002$) and “disliking sun” ($p=0.032$) were both not significantly related to gender [Figure 3].

Table 2 Legend (opposite page) >

- * Variable with multiple responses.
- † Included participants who took vitamin D as supplement
- ‡ Included participants with prescription from the doctor.
- § p value has been calculated using chi square test.
- * Significance was set at $p<0.05$ level.

Table 2: Characteristics of participants regarding exposure to ultraviolet rays of sunlight according to gender

Characteristics	Overall N (%) (n=790)	Gender		p value †
		Male N (%) (n=365)	Female N (%) (n=425)	
Exposure to sunlight				
• Yes	458 (58.0%)	293 (80.3%)	165 (38.8%)	
• No	332 (42.0%)	72 (19.7%)	260 (61.2%)	
Duration of sunlight exposure to obtain vitamin D				
• ≤10 minutes	161 (20.4%)	55 (15.1%)	106 (24.9%)	
• 15 minutes	362 (45.8%)	159 (43.6%)	203 (47.8%)	
• 30 minutes	153 (19.4%)	79 (21.6%)	74 (17.4%)	<0.001 ***
• >30 minutes	16 (02.0%)	09 (02.5%)	07 (01.6%)	
• I don't know	98 (12.4%)	63 (17.3%)	35 (08.2%)	
The best time for sun exposure *				
• 7–9 am	620 (78.5%)	283 (77.5%)	337 (79.3%)	0.548
• 10 – 3pm	106 (13.4%)	51 (14.0%)	55 (12.9%)	0.672
• 3–5pm	270 (34.2%)	103 (28.2%)	167 (39.3%)	0.001 ***
• I don't know	32 (04.1%)	17 (04.7%)	15 (03.5%)	0.423
Body that should be exposed to sunlight				
• Hands and face	211 (26.7%)	122 (33.4%)	89 (20.9%)	
• Hands, arms and face	41 (05.2%)	25 (06.8%)	16 (03.8%)	
• Hands, arms, face and legs	178 (22.5%)	100 (27.4%)	78 (18.4%)	<0.001 ***
• Others	360 (45.6%)	118 (32.3%)	242 (56.9%)	
The method of feeding, which is the most appropriate source of vitamin D				
• Breast feeding	755 (95.6%)	347 (95.1%)	408 (96.0%)	0.526
• Artificial feeding	35 (04.4%)	18 (04.9%)	17 (04.0%)	
Have you ever taken vitamin D as supplement?				
• Yes	376 (47.6%)	109 (29.9%)	267 (62.8%)	<0.001 ***
• No	414 (52.4%)	256 (70.1%)	158 (37.2%)	
If yes, did you take? *				
• Without prescription	150 (38.4%)	66 (53.2%)	84 (31.5%)	
• Prescribed by your doctor	241 (61.6%)	58 (46.8%)	183 (68.5%)	<0.001 ***
Prescribed vitamin D, doctor consultation*				
• Vitamin D deficiency	26 (10.8%)	06 (10.3%)	20 (10.9%)	
• Body ache	47 (19.5%)	09 (15.5%)	38 (20.8%)	
• Fatigue	09 (03.7%)	0	09 (04.9%)	0.106
• Hair loss	08 (03.3%)	0	08 (04.4%)	
• Others	151 (62.7%)	43 (74.1%)	108 (59.0%)	
Received advice on the importance of vitamin D by the PHC physician				
• Yes	246 (31.1%)	91 (24.9%)	155 (36.5%)	<0.001 ***
• No	544 (68.9%)	274 (75.1%)	270 (63.5%)	
Attended a health education seminar about symptoms of vitamin D deficiency				
• Yes	86 (10.9%)	33 (09.0%)	53 (12.5%)	0.123
• No	704 (89.1%)	332 (91.0%)	372 (87.5%)	

Table 3: Relationship between specialty among exposure to ultraviolet rays of sunlight and behavior of participants towards vitamin D

Statement	Specialty		p value §
	Healthcare N (%) (n=348)	Non-healthcare N (%) (n=442)	
Exposure to sunlight			
• Yes	214 (61.5%)	244 (55.2%)	0.075
• No	134 (38.5%)	198 (44.8%)	
Duration of sunlight exposure to obtain vitamin D			
• ≤10 minutes	57 (16.4%)	104 (23.5%)	0.016 *
• 15 minutes	170 (48.9%)	192 (43.4%)	
• 30 minutes	68 (19.5%)	85 (19.2%)	
• >30 minutes	03 (0.90%)	13 (02.9%)	
• I don't know	50 (14.4%)	48 (10.9%)	
The best time for sun exposure *			
• 7 –9 am	266 (76.4%)	354 (80.1%)	0.215
• 10 – 3pm	57 (16.4%)	49 (11.1%)	0.030 *
• 3 –5pm	139 (39.9%)	131 (29.6%)	0.002 **
• I don't know	11 (03.2%)	21 (04.8%)	0.260
Body that should be exposed to sunlight			
• Hands and face	86 (24.7%)	125 (28.3%)	<0.001 ***
• Hands, arms and face	27 (07.8%)	14 (03.2%)	
• Hands, arms, face and legs	97 (27.9%)	81 (18.3%)	
• Others	138 (39.7%)	222 (50.2%)	
Most appropriate method of feeding			
• Breast feeding	324 (93.1%)	431 (97.5%)	0.003 **
• Artificial feeding	24 (06.9%)	11 (02.5%)	
Have you ever taken vitamin D as supplement?			
• Yes	154 (44.3%)	222 (50.2%)	0.095
• No	194 (55.7%)	220 (49.8%)	
If yes, did you take it? †			
• Without prescription	78 (48.4%)	72 (31.3%)	0.001 ***
• Prescribed by your doctor	83 (51.6%)	158 (68.7%)	
Prescribed vitamin D and doctor consultation ‡			
• Vitamin D deficiency	07 (08.4%)	19 (12.0%)	0.067
• Body pain	09 (10.8%)	38 (24.1%)	
• Fatigue	03 (03.6%)	06 (03.8%)	
• Hair loss	02 (02.4%)	06 (03.8%)	
• Others	62 (74.7%)	89 (56.3%)	
Received important advice regarding vitamin D			
• Yes	84 (24.1%)	162 (36.7%)	<0.001 ***
• No	264 (75.9%)	280 (63.3%)	
Attended a health education seminar about symptoms of vitamin D deficiency			
• Yes	31 (08.9%)	55 (12.4%)	0.113
• No	317 (91.1%)	387 (87.6%)	

* Variable with multiple responses. † Included participants who took vitamin D as supplement ‡ Included participants with prescription from the doctor. § p value has been calculated using chi square test.* Significance was set at p<0.05 level.

Figure 1: Reasons for avoiding sunlight exposure (n=332)

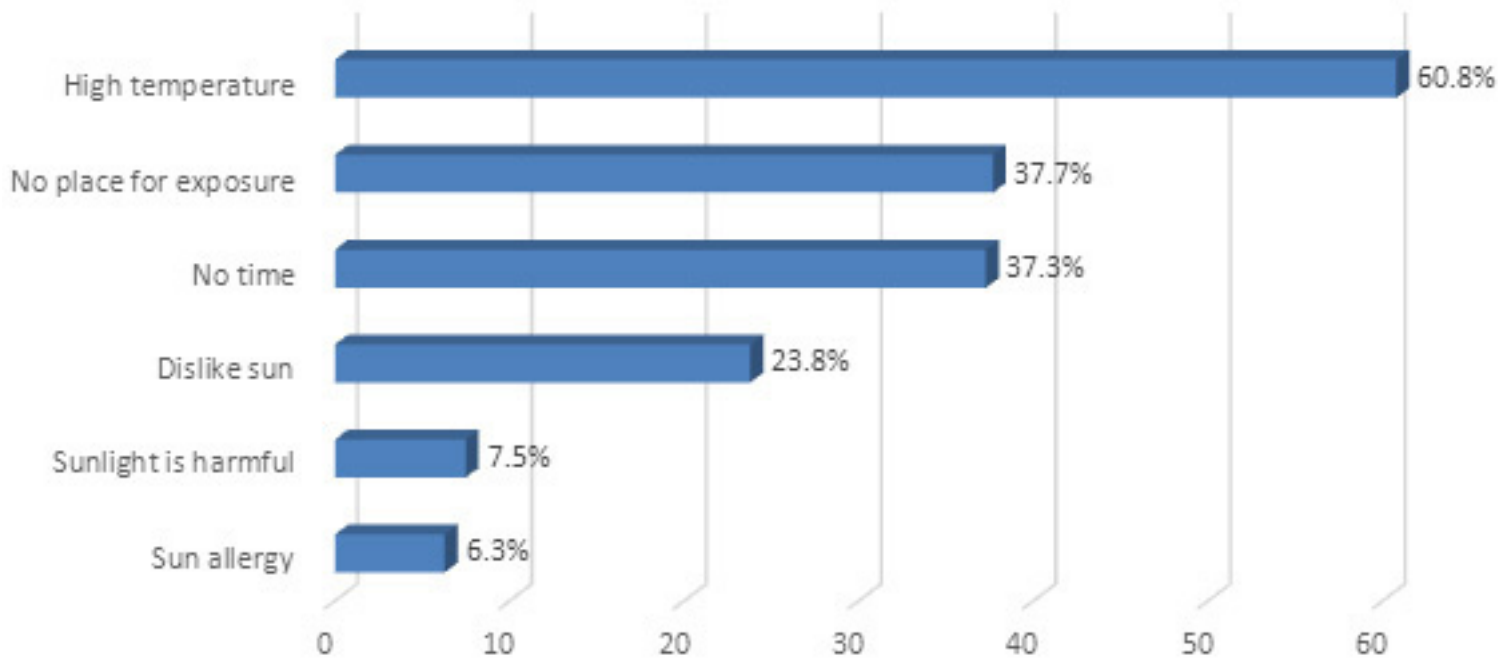


Figure 2: Appropriate sources of vitamin D

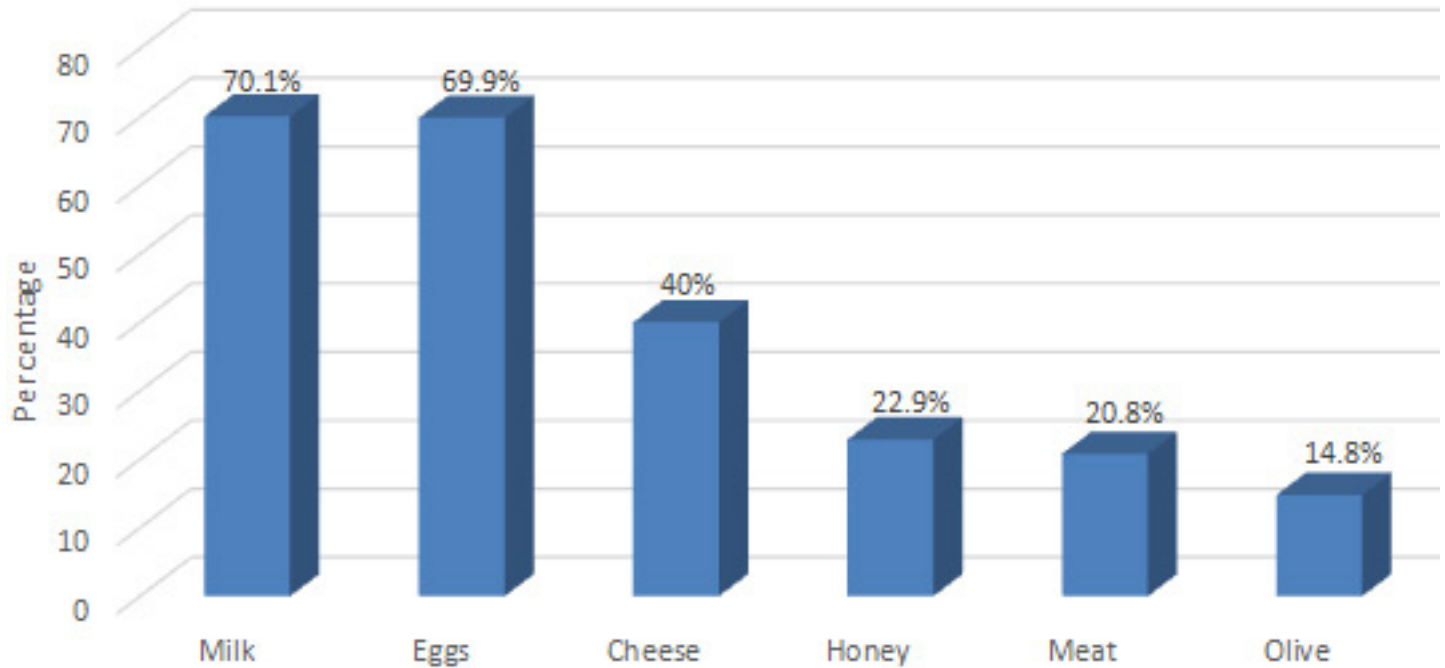
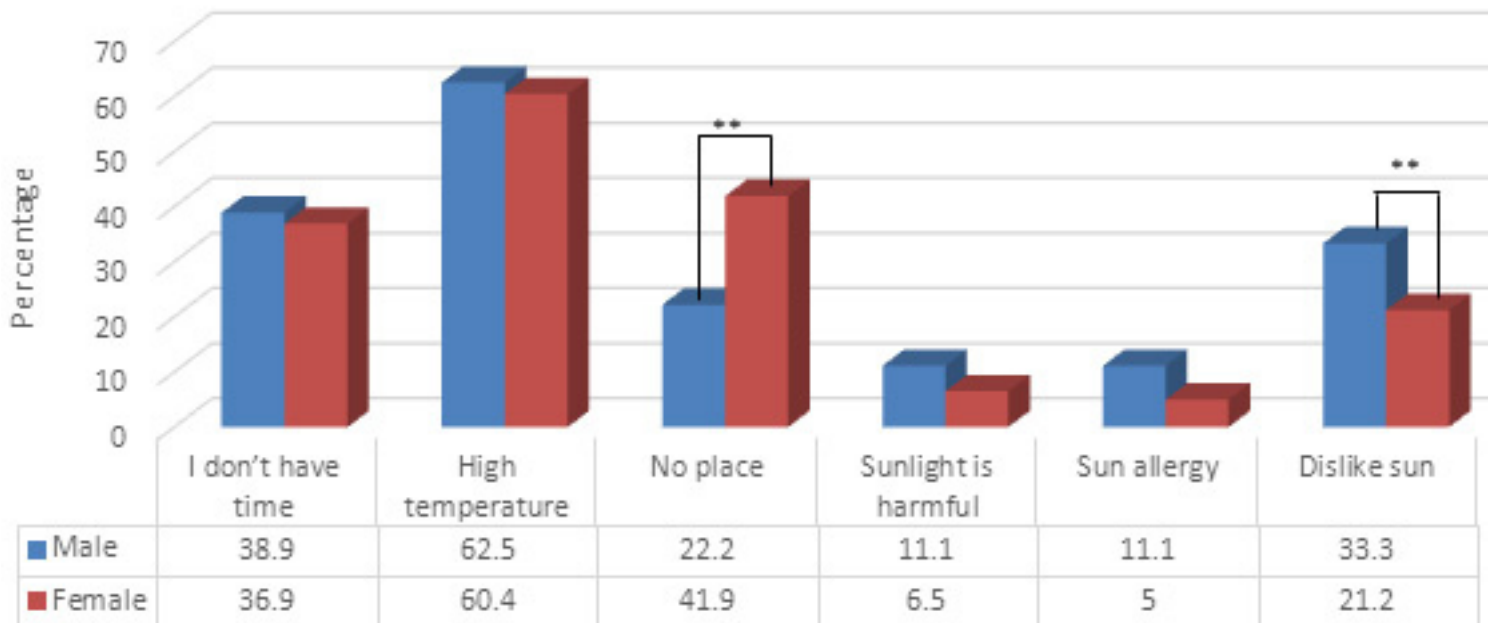


Figure 3: Evaluating the relationship between gender and the reasons to avoid sun exposure

** Significant at $p < 0.05$ level

Discussion

Socio-demographic features of participants affected their knowledge regarding vitamin D [Table 1]. In our study, female participants (62.8%, $n=267$) had a more significant knowledge than males (29.9%, $n=109$) about the importance of vitamin D and were taking it as a supplement ($p < 0.001$) [Table 2]. Our findings are consistent with a previous study which reported that both older people and men had lower levels of awareness of vitamin D deficiency and its consequences [15]. Gender differences in health-related behaviors have been studied many times and indicated that women are more aware of healthy eating than men [16]. Vitamin D deficiency is one of the major health problems worldwide with highest prevalence in Middle East countries [17-18]. Vitamin D deficiency has a major impact on the human body, and can lead to mild effects like fatigue or serious health effects such as rickets and osteoporotic fractures in the aged people [11]. Fortunately, treatment of vitamin D deficiency is applicable and easy.

The current study revealed a number of important findings where the majority of participants had significant knowledge about vitamin D and its main sources particularly sunlight [Table 1-2]. The majority of participants had the knowledge that the sun is the main source of vitamin D [Table 2] and [Figure 1]. More than half of those who did not get exposed to sunlight were avoiding exposure to sun light because of its high temperature [Figure 1]. Students in the health fields had better knowledge regarding vitamin D compared to other occupations ($p < 0.001$) [Figure 1]. A similar report confirmed that students in health fields knew the importance of vitamin D while 93% of them knew about vitamin D deficiency issues [19]. Many studies showed that high educational levels were associated with better knowledge about vitamin D. It was reported that those who had an academic degree had a higher level of knowledge than others. A similar result was

found in other countries where the better educated mothers had greater knowledge [20]. In our study, the relation between educational level and knowledge regarding vitamin D wasn't significant ($p=0.079$) [Table 1].

In our study, 58% ($n=458$) of the participants had knowledge about the importance of sunlight exposure for vitamin D synthesis [Table 1], which is similar to a finding of other studies that were conducted in Saudi Arabia e.g. a study done in Al-Qassim found that 90% of the participants were aware of vitamin D [21]. Another study done in Jeddah found that 89.6% of the participants had heard about vitamin D, [11] and a study that was conducted in the western Saudi region found that 70% of the participants had knowledge about vitamin D [22].

Vitamin D3 is produced in the skin in response to ultraviolet B radiation from sunlight and can be obtained from diet or dietary supplements. Vitamin D produced in the skin lasts longer in the blood than vitamin D from diet. We investigated if participants in this study have the knowledge that exposure to sunlight is an important source of vitamin D. We found that 58% of participants ($n=458$) were exposed to sunlight regularly ($p=0.004$) [Table 2]. In a French study, 72% of participants reported sun exposure as the main source of vitamin D [15]. In the study of Najran (in Saudi Arabia), more than two thirds (69.83%) said that ultraviolet rays of sun is the main source of vitamin D [7].

Then, we investigated participant's knowledge regarding the effects of sun exposure on vitamin D synthesis. Males (80.3%, $n=293$) had more exposure to sunlight compared to females (38.8%, $n=165$) ($p < 0.001$) [Table 2]. This could be attributed to the culture in Saudi Arabia as women spent most of the time indoors taking care of their children while men take the responsibility of working and earning money. Even after the recent increase in the number of women

who are employed, when they get out, they wear "Abaya; a clothing that covers the whole body". Therefore, they do not get enough sunlight exposure. High temperature was the most important cause of low exposure to sunlight followed by absence of appropriate places to get sun exposure and lack of time [Figure 1]. This indicates that the existing facilities are not enough and that we need to increase the number of parks and free walking sites. This finding could guide the authorities to pay more attention to the budgets of such facilities and to give it more focus in future plans. Regarding the needed duration of exposure to sun light, about one out of ten (12.4%, n= 98) did not have an idea at all [Table 2], while a fifth (20.4%, n=161) of the participants thought that 10 minutes is an enough time to meet the body demands, which is wrong [23]. It is recommended to have between 10 to 30 minutes exposure to sunlight [7-8]. More than 30 minutes exposure could increase the risk of skin malignancy especially in such hot weather [6, 23]. A similar result was found in a study that was conducted in Najran (in South Saudi Arabia) [7]. Most of the participants (78.5%, n=620) agreed that the best time for exposure is from 7-9 AM while a fewer number (34.2%, n= 270) believed that sun light exposure at 3-5 PM is also a good time [Table 2]. Only a few people (14.3%, n=178) thought that 10 AM - 3 PM is the right answer. But, the sun is very hot and harmful at this time [6]. Holick's rule dictates that exposing the face, arms and legs is essential to meet the body requirements of vitamin D [24]. Most of the answers were wrong as almost one quarter (22.5%, n=178) of the participants answered this question correctly. In future plans to increase public awareness, this information should be among the top concepts to be corrected. The vast majority of males and females (95.6%, n=755) think that breast feeding is the most important source of vitamin D [Table 2]. However, this is not correct as breast feeding is not enough for infants as a sole source of vitamin D. Formula feeding is better regarding giving enough vitamin D to the baby taking in consideration the level of vitamin D of the mother. An alternative way is to give the mother vitamin D as a supplement to enrich their milk with it [24].

Then, we came across important findings. We found out that the vast majority of participants have chosen milk and eggs as sources of vitamin D, which reflects a good knowledge about foods rich in vitamin D [Figure 2]. Our research found that 22.9% of the participants (n=181) in this study mistakenly chose honey as a rich source of vitamin D [Figure 2]. However, this is not correct as honey only has a small percentage of vitamin D. Olive was the least chosen answer, which reflected a good knowledge about the best source for vitamin D. We found that 47.6% of participants (n=376) are taking vitamin D supplements among whom females are the majority (62.8%, n=267) compared to males (29.9%, n=109) [Figure 2]. This difference may be attributed to the culture as females cover their body with abaya and subsequently there is less exposure to sunlight. Among those, 38.4% (n=150) who took vitamin D were taking it without prescription and more than half of them were males. Our results showed that 61.6% (n=241) had a prescription from a doctor for treating another medical condition. We found that 19.5%

of participants (n=47) are taking vitamin D due to body pain while only 10.8% (n=26) had a consultation due to vitamin D deficiency among whom the female ratio was 3 times higher than the males [Table 2].

Limitations and weaknesses

Weakness points in this survey include being electronic and was only distributed through social-media applications. So, people who are not familiar with technology, like the elderly and illiterates, did not participate in this study. Also, many of the referential studies were not conducted in Saudi Arabia as there is lack of local studies.

Conclusion

There is a big need to improve the public knowledge on vitamin D in Al-Madinah Al-Munawwarah, which is consistent with many previous studies that were conducted in different regions of Saudi Arabia. Female participants and those with high levels of education are more aware about vitamin D. Males have more sun exposure than females. There is a knowledge gap regarding the appropriate way to get vitamin D through increasing sunlight exposure, increasing the duration of exposure and selecting the best time of the day and the parts of the body needing to be exposed.

Our recommendations are to improve awareness and health education, to modify the attitude regarding sun exposure and food consumption and to recommend intake of multivitamin tablets that contain 10 micrograms (400 IU) of vitamin D (whenever necessary under medical supervision) that may have an effective role in improving individuals' awareness and preventing vitamin D deficiency.

Moreover, primary health care doctors should encourage and educate the patients and the families about the importance of vitamin D and the consequences of its deficiency. This can be achieved by taking extra clinic time, using social media to share some medical information (the highest as a source of information) and by arranging regular awareness campaigns in the community.

Also, teachers should be educated about Vitamin D and its role. It is good to arrange courses for them to raise their awareness and knowledge regarding Vitamin D. Eventually, they will educate their students.

Social media have an important role in awareness about public health issues, so it will be good for health care workers if they increase the effort and time to participate in programs aiming at health education on media.

We also recommend increasing the number of outdoor areas for women to allow greater sunlight exposure where women can uncover freely. We should increase incidental sun exposure through routine daily outdoor activities that may help increase sunlight exposure for vitamin D activation.

Also, awareness in rural areas should be investigated separately as most of the studies were conducted on major cities where people are more educated.

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Consent: Informed consent obtained from all the participants. Ethical committee approval and participants' consent were obtained according to the declaration of Helsinki. The study was approved by the ethical committee of Taibah College of Medicine, Taibah University, Al-Madinah Al-Munawwarah, Saudi Arabia. Date of decision 27/12/2018. Registered at US department of health and human services IORG0008716 - IRB00010413.

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Appendectomy as a risk factor for ectopic pregnancy in Taif city

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Abstract

Background: Ectopic pregnancy (EP) is a common obstetric emergency, with high pregnancy related mortality in the first trimester. A major risk factor for EP is surgical procedure that may cause tubal damage and scarring. One of the most common surgery is appendectomy that may lead to adhesions and consequently an EP.

Objective: to assess the association and evidence supporting the relationship between appendectomy and EP.

Methods: An online cross-sectional case-control study was conducted among cases of women diagnosed with EP, and controls of women who had a normal pregnancy in Taif city in the period from October 2018 to October 2019. A checklist was used that included items on the participants' age, nationality, family history of EP, IUD use, pelvic intervention, pelvic inflammatory diseases, and STDs. For study cases, items about the period between appendectomy and EP, the week of diagnosis of EP and whether treated for EP with medication or surgery were added.

Results: The mean age of the participants was (36.71 ±11.49) years; 11.9% had a family history of EP, 77.3% used intrauterine devices, 13.9% had a previous history of a pelvic intervention, 9.9% had a past history of pelvic inflammatory diseases, 7.9% had a history of STDs, and 22.8% had a history of appendectomy. Cases had a significant higher percentage of those who suffered pelvic inflammatory disease and those who had a history of appendectomy, compared to controls. Binary logistic regression found that having a history of pelvic inflammatory diseases and a history of appendectomy were independent predictors for having EP.

Conclusion: This study calls for taking a careful history from all pregnant women to assess any risk factors of ectopic pregnancy and to provide proper management to all health problems that may be considered a risk factor of EP.

Key words: Appendectomy, risk, factor, ectopic, pregnancy, Taif

Introduction

A pregnancy that occurs outside the uterine cavity is called an ectopic pregnancy (EP) (1). It is a major health problem for pregnant women (2). EP is considered as a common obstetric emergency (3). EP can lead to massive hemorrhage and infertility and causes pregnancy-related death in the first trimester, accounting for 9-13% of all pregnancy-related deaths.

In the United States, an estimated 30-40 women die each year from an ectopic pregnancy (8). Ninety-five percent of EP's are in the fallopian tubes and 5% are in the cervix, ovaries or abdomen (3). The incidence of EP varies within the population and accounted for 1-2% of all reported pregnancies according to an Iranian and an American study (1,2). The risk factors of EP include a history of pelvic inflammatory disease (PID), previous history of EP, use of an intrauterine device, previous abdominal surgeries, microsurgical procedures, salpingitis, and periadnexal adhesions which showed a significant positive correlation with EP as the outcome (1,6,7).

It is speculated that the main risk factors for EP are conditions or procedures that can cause tubal damage (2). One of those procedures is appendectomy. Appendectomy is the standard treatment for acute appendicitis (4). The most common disease in general surgery is acute appendicitis and the most common surgical procedure is appendectomy (9). The other option of management is an operation; deciding the method if it is open appendectomy or laparoscopy depends on many factors including patient status, availability and expertise (5,9).

In the Kingdom of Saudi Arabia, previous studies showed a prevalence of EP between 0.58–1.13% (10,11,12). A retrospective study was done between January 2000 and December 2010 in all patients admitted to King Fahd Hospital of University, Al-Khobar, Kingdom of Saudi Arabia. This study showed that the prevalence of EP was 1.13%. In those who are undergoing In Vitro Fertilization (IVF), ovulation induction (OI), previous EP patients are significantly more prone to acquire EP the bsecond time around (12).

Studies that assessed the relationship between appendectomy and EP in KSA are scarce, and there is not sufficient data assessing this relationship in Taif city, Saudi Arabia. This study aims to assess the association between appendectomy and EP among a sample of females in the reproductive age.

Subjects and Methods

Study design: An online cross-sectional case-control study among cases was designed to assess the effect of appendectomy on future EP among married women in Taif city hospitals.

Study duration: From October 2018 till October 2019. Study settings: An online survey using a pre-designed questionnaire was used for collecting data from the participants.

Sampling methodology: According to the participants' responses to the online survey during the study period, the first 32 participants who reported that they were diagnosed with EP were considered as the study cases, and the first 69 respondents who reported that they had a normal pregnancy were considered as the study controls.

Inclusion criteria: Cases were females of reproductive age group diagnosed with EP, and controls were females of reproductive age group who had a normal pregnancy.

Exclusion criteria: Other cases of acute abdomen not diagnosed as EP

Study instrument: The method of data collection was an online survey that contained items on the participant's age, nationality, family history of EP, IUD use, pelvic intervention, pelvic inflammatory diseases, and STDs. For cases, items about the period between appendectomy and EP, the week of diagnosis of EP, and whether treated for EP with medication or surgery, were added.

Ethical Considerations: The Research Ethics Committee of Taif University approved the study, and official approvals were also obtained from directors of the study settings.

Statistical analysis: Data were coded, tabulated and analyzed using (SPSS) version 20 (Armonk, NY: IBM Corp.). Qualitative data was expressed as numbers and percentages, and Chi-squared test (χ^2) was applied to test the relationship between variables. Quantitative data was expressed as mean and standard deviation (Mean \pm SD), and independent sample t test was applied for comparison between variables. The binary logistic regression analysis which is a statistical tool to analyze the independent predictors with its odds ratios for a binary outcome (EP) was done.

Results

Table 1 shows that the mean age of the participants was (36.71 ±11.49) years, and 92.1% of them were of Saudi nationality. Of them, 11.9% had a family history of EP, 77.3% used intrauterine devices, 13.9% had a previous history of a pelvic intervention, and 3% were smokers. Only 9.9% of the participants had a past history of pelvic inflammatory diseases, 7.9% had a history of STDs, and 22.8% had a history of appendectomy.

Table 2 shows that among the cases, most of them (59.4%) had a period between appendectomy and EP of less than one year, and the mean period of diagnosis of EP was 5.5± 2.25 weeks of pregnancy. Most cases (78.1%) had medication for treatment of EP.

Table 3 shows that cases had a significantly higher percentage of those who suffered pelvic inflammatory diseases compared to controls (70% vs 30%) ($p<0.05$). On the other hand, a non-significant difference was found between cases and controls according to their age, nationality, family history of EP, intrauterine device use, history of pelvic intervention or history of STDs.

Figure 1 shows that cases had a significantly higher percentage of those who had history of appendectomy compared to controls (52.2% vs 47.8%) ($p<0.05$).

Table 4 shows that by doing binary logistic regression analysis to detect the independent predictors for the studied variables, it was found that having a history of pelvic inflammatory diseases and a history of appendectomy were independent predictors for having EP.

Table 1: Descriptive data and past clinical history of the whole sample

Variable	No. (%)
Age (Mean ±SD)	36.71 ±11.49
Nationality	
- Saudi	93 (92.1)
- Non-Saudi	8 (7.9)
Family history of EP	
No -	89 (88.1)
Yes -	12(11.9)
Intrauterine device (IUD) use	
No -	23 (22.7)
Yes -	78 (77.3)
If yes: what type of device (No.:23)	
Sliver -	3 (3)
Copper -	8 (7.9)
Hormonal -	3 (3)
I don't know -	9 (8.9)
History of pelvic intervention	
- no	87 (86.1)
- yes	14 (13.9)
History of pelvic inflammatory diseases	
- No	91 (90.1)
- Yes	10 (9.9)
History of STDs	
- No	93 (92.1)
- Yes	8 (7.9)
Smoking	
- No	98 (97)
- Yes	3 (3)
History of appendectomy	
- No	78 (77.2)
- Yes	23 (22.8)

Table 2: Descriptive data of EP history of cases

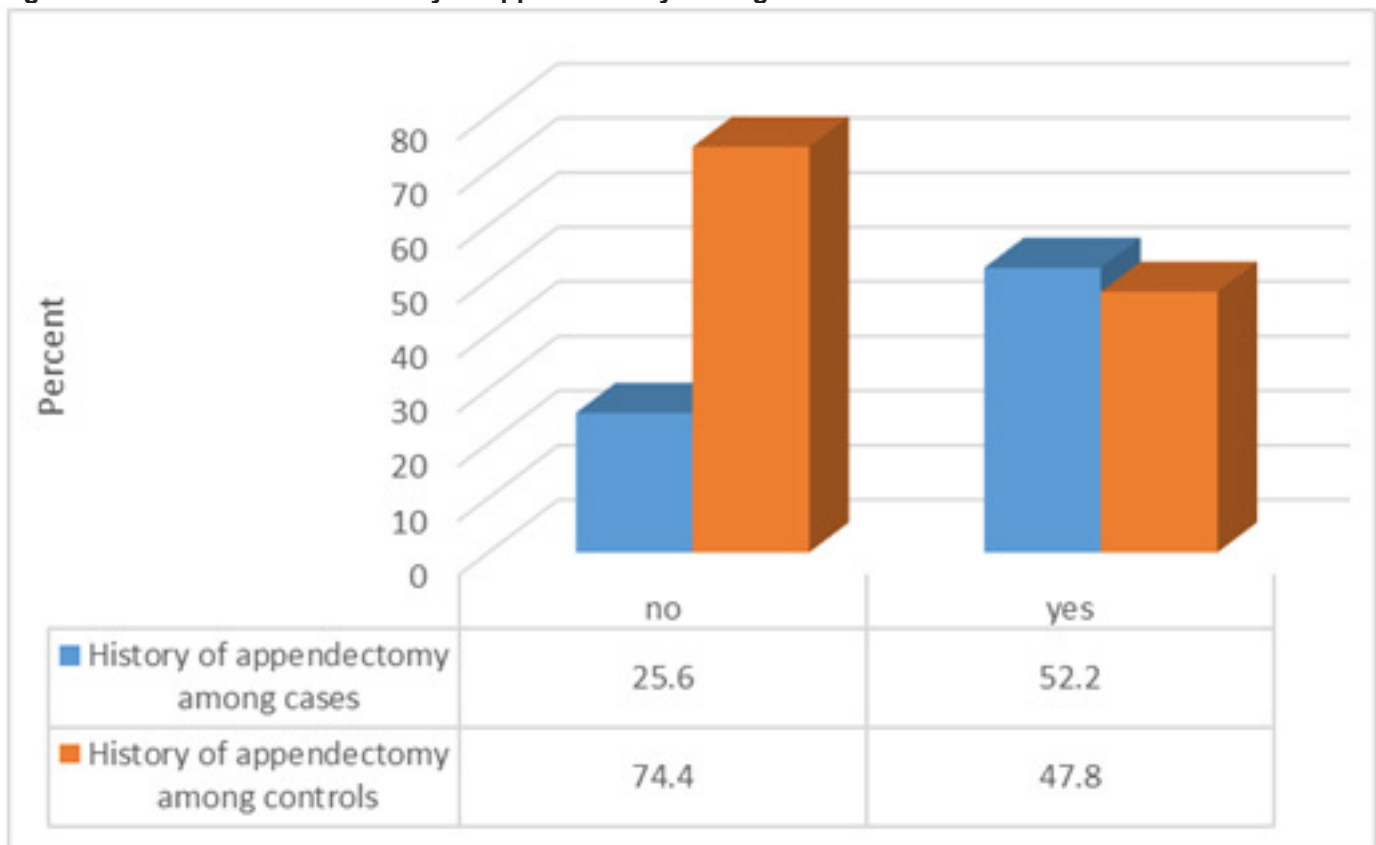
Variable	No. (%)
Period between appendectomy and EP	
- Less than 1 year	19 (59.4)
- 1-< 2 years	8 (25)
- 2-< 3 years	2 (6.3)
- More than 3 years	3 (9.4)
In what week were you diagnosed with EP? (Mean \pmSD)	5.5 \pm 2.25
Were you treated for your EP with medication or surgery?	
- Medication	25 (78.1)
- Surgery	7 (21.9)

Table 3: Comparison between cases and controls according to descriptive data and past clinical history

Variable	Case (No.32)	Control (No. (69)	test	p-value
	No. (%)	No. (%)		
Age (Mean SD)	37.59 \pm11.98	36.31 \pm11.31	0.51*	0.6
Nationality				
- Saudi	29 (31.2)	64 (68.8)	0.13**	0.71
- Non-Saudi	3 (37.5)	5 (62.5)		
Family history of EP				
- No	27 (30.3)	62 (69.7)	0.62**	0.42
- Yes	5 (41.7)	7 (58.3)		
Intrauterine device use				
- No	25 (32.1)	53 (57.9)	0.02**	0.88
- Yes	7 (30.4)	16 (69.6)		
History of pelvic intervention				
- No	25 (28.7)	62 (71.3)	2.51**	0.11
- Yes	7 (50)	7 (50)		
History of pelvic inflammatory diseases				
- No	25 (27.5)	66 (72.5)	7.52**	0.006
- Yes	7 (70)	3 (30)		
History of STDs				
- No	27 (29)	66 (71)	3.81**	0.05
- Yes	5 (62.5)	3 (37.5)		

N.B.: * (χ^2) test

**independent sample t test

Figure 1: Distribution of the history of appendectomy among cases and controls**Table 4: Binary logistic regression analysis regarding the risk factors for EP the studied sample**

Variable	EP			Significance
	Beta	Wald	Odd's Ratio	
History of pelvic inflammatory diseases	0.43	0.27	3	0.003
History of appendectomy	0.23	0.21	2.3	0.023

Discussion

In Saudi Arabia, it was reported that there is an increasing rate of EP. A study was done in 2011 to estimate trends in ectopic pregnancies (EP) in a tertiary care center of Eastern Saudi Arabia between January 2000 and 31 December 2011. The yearly incidence in terms of 24,098 deliveries was 1.19% (13).

In the present study, a non-significant difference was found between cases and controls according to the family history of EP, intrauterine device use, or history of pelvic intervention or history of STDs.

Previous studies have found that previous pelvic interventions such as caesarean section was found to be associated with the risk of ectopic pregnancy (10). Our result is different from a study done by Mollison et al (14) who found that women who were delivered by caesarean section were less likely to become pregnant again compared with those who had spontaneous delivery and when these women become pregnant again, compared with those who had spontaneous vaginal delivery, they were more likely to have ectopic pregnancy than others (14,15).

The use of IUD was found to be associated with the risk of ectopic pregnancy in previous studies which found that IUD usage may have an etiological role in ectopic pregnancy (10, 16,17).

The present study showed that EP cases had a significantly higher percentage of those who suffered pelvic inflammatory diseases compared to controls, and cases had a significantly higher percentage of those who had history of appendectomy compared to controls. The same results were revealed from previous studies which showed the association between pelvic surgery such as appendectomy and ectopic pregnancy. These studies explained the peritoneal and peritubal adhesions that occur following these surgeries (18,19,20). The same result was observed in a previous study, where some anomalies, such as miscarriage, ovarian torsion, ovarian cysts, acute appendicitis, kidney stones and pelvic inflammatory disease, have the same signs as an ectopic pregnancy (21).

A study done in Yemen found that the history of previous surgical abdominal operations was detected in (10.77%) cases of EP, and appendectomy was found in 5.83% of cases (22).

In agreement with our study is a Chinese study done in 2015 where women who were diagnosed with intrauterine pregnancies were recruited. This study found that among the risk factors of EP was previous appendectomy (23). In the same time, an Iranian case-control study done in 2014 agreed with our results as women with histories of laparotomy and appendectomy were found to be more likely to have EP compared with controls (24).

Limitations

A limitation of the present study was the small sample size.

Conclusion

The present study observed that pelvic inflammatory diseases and a history of appendectomy were independent predictors for having EP. This study calls for proper training of all physicians to take a careful history from all pregnant women to assess any risk factors for ectopic pregnancy and to provide proper management of all health problems that may be considered a risk factor for EP.

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Epidemiology of Hepatitis B in Salahaldeen

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Abstract

Background: Viral hepatitis has gained little attention and funding from global health policymakers. Every year one million people die from viral hepatitis-related chronic consequences. Iraq, a country of intermediate endemicity for hepatitis B rates has noted an increase with a stated prevalence rate of 1.6% among the general population.

Materials and Methods: Data of reported 21,626 personnel who were investigated for HBsAg were retrieved from the Salahdeen health directorate covering a period of one year (2018). Tables and figures were used to summarize the data.

Results: The prevalence of HBsAg was 1.2%; males were affected more than females. Winter season carried more positive records of hepatitis B than other months of the year. The majority of HBsAg positive were between 15-45 age group; zero cases were recorded below 15 years of age.

Conclusion: Monitoring the general population and subpopulation is a continuous process that is required to control hepatitis B; encouraging Hepatitis vaccination and promoting education about risky behaviors is needed.

Key words: Hepatitis B, epidemiology, pattern of HB, HBs Ag

Introduction

Viral hepatitis is of extreme concern because of the burden of illness and demise it causes, in addition to the potential for outbreaks and epidemic spread [1].

Approximately one third of the world population has serological evidence of past or present infection by HBV. Globally, the prevalence of HBV infection reached 3.5% which literally means that nearly 257 persons are living with HBV per million. Viral hepatitis has drawn little attention and funding from global health policymakers. The estimated prevalence of hepatitis B surface antigen in the Eastern Mediterranean region countries was 3.3%; reflecting 21-28 persons living with HBV per million, while the percentage rises to 6.1% of the African population, and 6.2% of the Western Pacific region [2,3].

Iraq, is an Eastern Mediterranean country of intermediate endemicity for hepatitis B with a stated prevalence rate of 1.6% in the general population [4]. The usual mode of transmission is blood transfusions or repeated exposure to blood and its derivatives. According to the WHO records Iraq reported (3,674) cases for hepatitis B. This was owing to the enlargement of diagnosis in district labs. Each district has an enzyme-linked immunosorbent assay (ELISA) machine for hepatitis diagnostics [1,4].

Hepatitis B virus transmission is associated with increasing viral loads and is more infectious than hepatitis C, with a transmission rate of up to 30% being reported. HBV exposure can occur in the following situations: Sexual contact (partner infected with HBV, multiple sexual partners, men who have sex with men), parenteral contact (injection drug users, hemodialysis, and healthcare workers), household contacts (infected parents/siblings, shared personal hygiene items like toothbrushes, razor blades, nail clippers). It had been suggested that these select populations should be routinely screened by testing for hepatitis B surface antigen, antibody against hepatitis B surface antigen (anti-HBs), and antibody against hepatitis B core antigen (anti-HBc) [5,6].

The natural progression of HBV to chronic infection is inconstant, ranging from an inactive HBsAg carrier state to a more or less progressive chronic hepatitis, hypothetically evolving to cirrhosis and hepatocellular carcinoma (HCC) in many cases [7,8].

During the 1980s, Iraq was considered to be a country of an intermediate endemicity with hepatitis B as reflected by 3% seroprevalence of HBsAg in the normal population [9].

After 2013 an increase in viral hepatitis rates was notable; the overall seroprevalence of HBsAg was found to be 4.73%. These viral chronic infections may not show symptoms for a long period, sometimes years or decades. At least 60% of liver cancer cases are due to late testing and treatment of viral hepatitis B [10,11].

Materials and Methods

A descriptive study was done on data of one-year reports of people with suspected hepatitis B, documented in the public health department of Salahdeen health directorate from 1st January to end of December 2018. A total of 21,626 records were entered into Statistical package of social sciences (SPSS) version 22. Data were presented with frequencies and percentages; tables and figures were also used to summarize the data.

Results

A total 21,626 patients were tested for HBsAg; as shown in Figure 1; 264(1.2%) were positive, and 21,362 (98.8%) were negative. Of those with a positive test 151(57.2%) were males, and 113(42.8%) were females. Table 1 demonstrates the distribution of the studied sample by gender.

The higher number of reported cases were in winter months November 28(1.6), January 30 (1.5%), then in March 39(1.6%). This figure is also true for reported prevalence among males and females, as shown in Figure 2 (page 40).

The commonest positive cases percentage was among those aged 16-45 years, 215(1.32%), followed by 6-15 years 23(1.08%). Zero positive cases were reported for lower than 5 years old, as shown in Table 2.

Discussion

The current study showed that the majority of tested subjects were negative for HBsAg and that the prevalence of HBV was 1.2%. This result is in agreement with findings from another study in Mosul 2013 (HBV 1.2%) [12], Dohuk 2018 (HBV 1.1%) and Diyala in 2012 (HBV 1.1%) [13,14] which probably reflects both the similarity of health system recording and the low prevalence of HBV in these similar societies.

It also agrees with findings from another conservative society like Saudi Arabia where in 2019 HBV seropositive prevalence was 1.3 % among the general population [15]. But our findings were lower than the results reported in Lebanon in 2016 where the seropositive prevalence of hepatitis B was 1.7% [16]. It is also lower than the levels reported in Baghdad in 2012 among the general population where HBV prevalence was 3.0% [17] as well as lower than the data reported from Samara district where the overall seroprevalence of HBsAg was found to be 3.2% [8]. These differences might be related to population density between governorates and capital. It has been described that these variations among the same country are very commonly conveyed and probably justify a regular monitoring of seropositive levels among the general and sub populations [18].

Figure 1: The distribution of patients according to HBsAg positivity

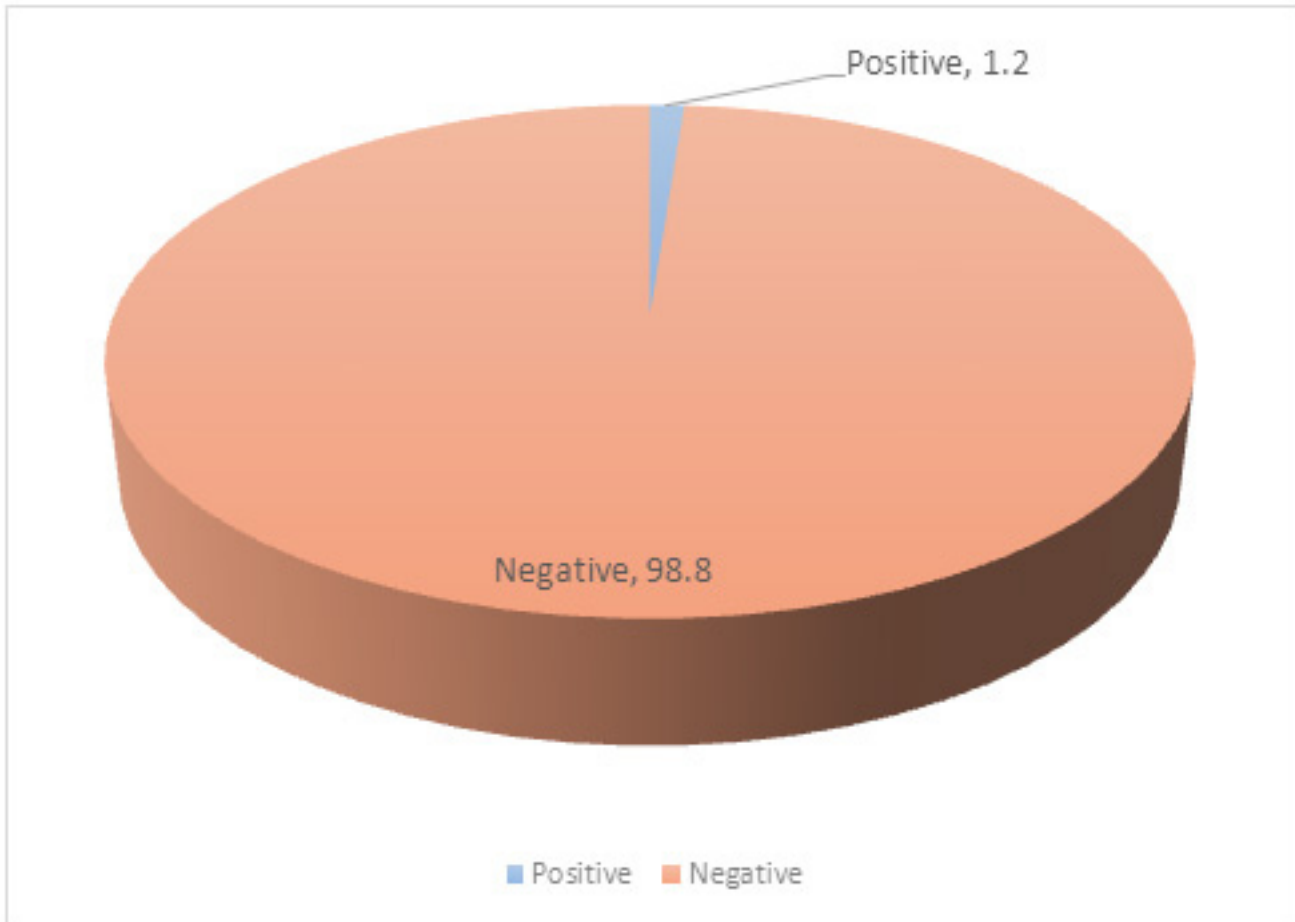
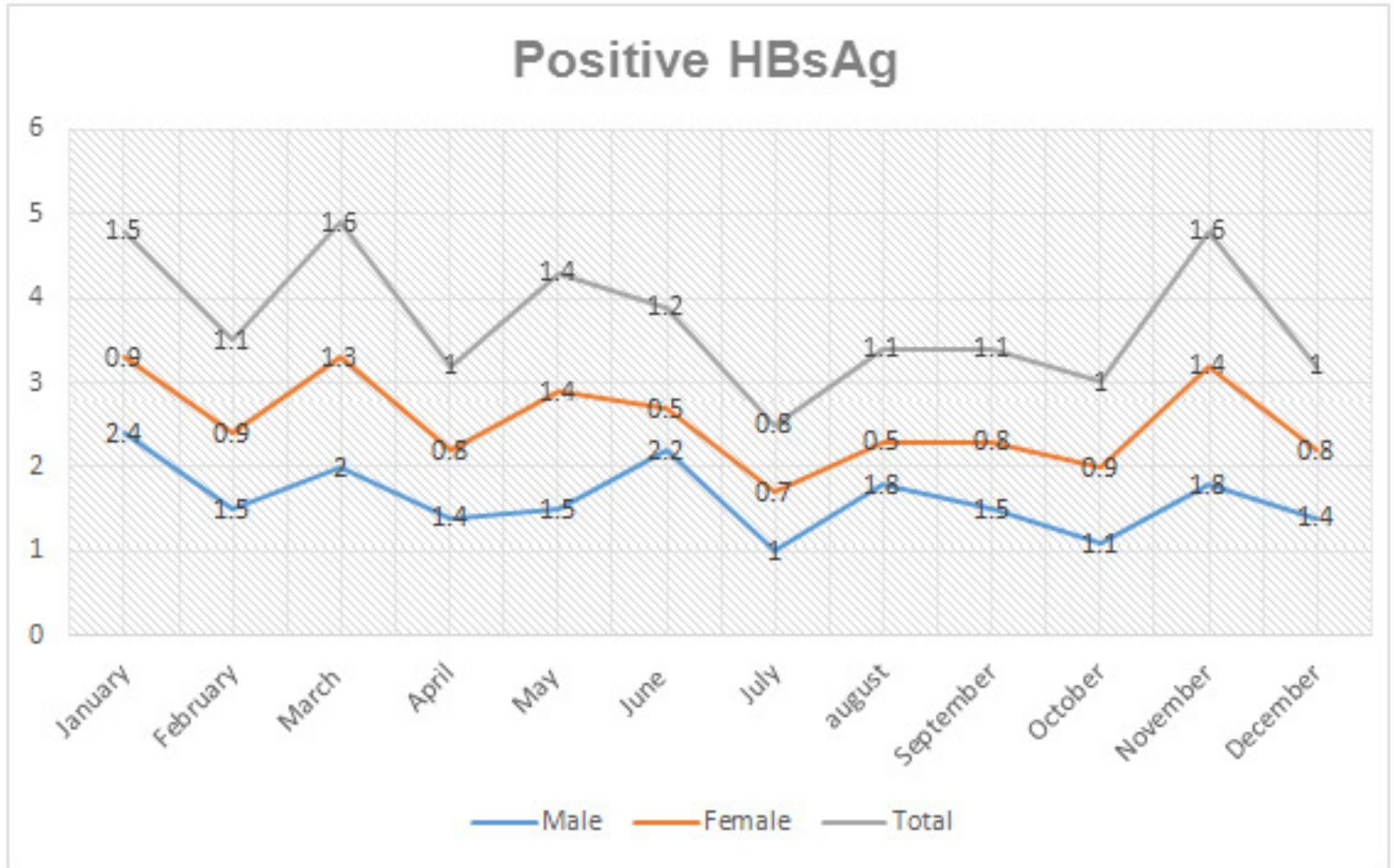


Table 1: distribution of study sample according to gender and HBsAg.

Hepatitis B status	Male		Female		Total	
	F	%	F	%	F	%
Positive HBsAg	151	57.2	113	42.8	264	100.0
Negative HBsAg	9038	42.3	12324	57.7	21362	100.0
Total	9189	42.5	12437	57.5	21626	100.0

Table 2: distribution of positive HBsAg cases according to age

Age	Positive HBsAg		Total tested	
	F	%	F	%
<1 year	0	0	9	100%
1-5y	0	0	201	100%
5-15y	23	1.08	2125	100%
15-45y	215	1.32	16279	100%
>45y	26	0.86	3012	100%
Total	264	1.22	21626	100%

Figure 2: The distribution of positive cases detected according to month of registration

Hepatitis B tends to occur among males (57.2%) more than females (42.8%) agreeing with results from Basra by Al Rubaye A. et al in 2016 [19]. This might be related to the lifestyle of males that allows them to be freer and more up-to-the-minute with society trends like tattooing and piercing; probably further research might focus on HBV-causing trends among the youth.

The higher reported cases were in cold months, nearly 1.6% in November, 1.5% in January, then in March 39(1.6%). There are few to no Iraqi studies that correlate seasons to the prevalence of hepatitis yet in USA seasonality of illicit drugs has been reported to be higher in winter than in summer among the USA teens (12–17 years of age). Additionally, a recent longitudinal study of cocaine and cocaine metabolites revealed a clear seasonal difference indicative of human seasonal cocaine use patterns [20,21].

This observation could help in clearing up seasonal occurrence of HBV in developed countries although drug abuse is present in our country. In one study, it had been noted that the administration of Hepatitis B vaccine during winter was found as an important predictor of the low effectiveness of vaccination. To improve the effectiveness of Hepatitis B vaccination in the governorate, cold chain control should be addressed with particular attention to the winter season [22]. The prevalent use of hepatitis B immunization in newborns has considerably reduced the occurrence of HBV infections. Between the pre-vaccine era (which can range from the 1980s

to the early 2000s) and 2015, the proportion of children under the age of five years who became chronically infected fell from 4.7% to 1.3%. The residual infections generally occur from the mother at birth or through contact with other infected young children [2].

Thus, the WHO elimination plan focuses on vaccination; it is after all the primary intervention, since the global incidence of chronic hepatitis B is largely driven by mother-to-infant and early-childhood infection. Hepatitis B vaccine has been integrated with four other vaccines (for diphtheria, tetanus, pertussis, and Haemophilus influenzae type b infection) in a pentavalent formulation. Nonetheless, there were still approximately 4.7 million new chronic hepatitis B cases in 2015, and the 2030 goal of reducing that number by 90% requires additional measures [2, 6, 23].

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Attitude and Awareness Toward Heart Attack Symptoms and Lifesaving Actions Among Population of Western Region, KSA

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Abstract

Background: Awareness of basic life support (BLS) and cardiopulmonary resuscitation (CPR) protocols ensure the patient's survival long enough before medical intervention. Objectives: The aim of this study was to assess the attitude and awareness about heart attack symptoms and lifesaving actions among the population.

Methods: A cross-sectional study was done through an online survey on 6,113 residents of the Western region in Saudi Arabia. A pre-designed questionnaire was used to collect data about sociodemographic characteristics, having heart disease, or a heart attack in the participant or one of their family, sources of information about the heart attack, and knowledge about heart attack and CPR.

Results: 40% of the participants had heard about heart attacks and 65.5% knew that the first step to take if they witness a person suffering from symptoms of heart attack was to call the ER. Only 30.7% of the participants had attended a CPR course and 14.7% had rescued someone from an emergency and only 30.9% knew how to arrange resuscitation steps in order of priority for an adult. Participants with a university education, who had a medical specialization, who had a heart disease themselves or had a heart attack in one of their family and those who had a friend as a source of information had a significant higher mean Knowledge score about heart attack and CPR.

Conclusion: There is a need to raise knowledge about heart attack and train the Saudi population in lifesaving action by conducting training courses and awareness campaigns.

Key words: Attitude, Awareness, Heart, Attack, Lifesaving, Western, KSA

Introduction

Cardiac arrest or heart attacks are the commonest global emergency which end up in serious consequences and mortality (1). Heart attacks may be simply prevented by easy maneuvers and skills, with awareness of basic life support (BLS), therefore guaranteeing the survival of the patient (1).

The heart attack (also known as myocardial infarction) happens when a segment of the heart muscle does not get enough blood supply leading to major causes of heart problems. Sudden cardiac death (SCD) is a common deadly event outside the hospital worldwide, often happening in the early age of life (3,4).

The common manifestations of a heart attack are:

- 1) pressure, pain or squeezing sensation in the chest or arms, may spread to neck, jaw or back;
- 2) nausea and heartburn;
- 3) fatigue and lightheaded, or sudden dizziness;
- 4) shortness of breath;
- 5) cold sweating (2).

Awareness of basic life support (BLS) and skills in cardiopulmonary resuscitation (CPR) protocols ensure the patient's survival long enough before professional medical support arrives, which is itself adequate for survival in most situations (1). Basic life support (BLS) translates to the skills that need virtually no or little resources to save lives of cardiac or respiratory arrest casualties. BLS involves cardiopulmonary resuscitation (CPR), the use of an automatic external defibrillator (AED) and the clearing of foreign bodies of obstructed airways for individuals among all ages (5). Early interference in case of a heart attack is important for avoiding mortality (2).

The CPR technique provides a variety of chest compressions which act as heart pumping to allow the brain and other vital organs to maintain flowing of blood oxygen (6), and act as lungs by delivering positive pressure breathing to the patient, all of this helps to prevent complications (5). There are two main elements for effective resuscitation and reduction of avoidable deaths such as knowledge of CPR and successful CPR performance at the earliest opportunity (7).

Not only are BLS skills important for healthcare workers, but every member in the community can learn easily by joining BLS courses (5). It is necessary to motivate families, friends and communities to know the obvious signs and symptoms of a heart attack and calling for emergency services then start doing CPR immediately (2).

In the Kingdom of Saudi Arabia (KSA), an old study done in 2008 found that 31% of university students in Riyadh did not have prior CPR knowledge, and of those with previous knowledge, 85% felt that it was inadequate, and the most common sources of information were television and movies (8).

In 2018, a study was done to assess knowledge, attitudes, and behaviors of the general Saudi society toward CPR. The study found that 78.3% of respondents had heard of CPR, with media being the primary source of information, and 60.9% of respondents knew the correct hand positioning for chest compressions. About 43% of respondents reported that they would refuse to perform CPR if required due to lack of knowledge (61.3%) and fear of making the situation worse (33.3%) (9). A study was done in 2018 to determine knowledge about CPR among the university Students in the Northern Region of KSA. The study found that medical students had a higher score of knowledge compared to non-medical students (10). However, other studies found that medical students still have low fundamental knowledge about BLS (5).

Another study was done in 2019 and found that knowledge about BLS and Emergency Medical Services among healthcare interns was below average (11). A study was done in Taif city in 2019 to assess knowledge about first aid skills among medical and non-medical students. The study showed a strong understanding of first aid and BLS among 56.6% of the participants. However, the attitude towards first aid was very bad and a positive attitude towards it was just 8% (12). Studies have revealed that frequent education to maintain an acceptable level of BLS skills is highly recommended (13), and increased experience of CPR would improve the students' functional skills (6).

There are no similar studies done in Western region of KSA that assessed population knowledge about heart attack symptoms and CPR. Thus, the aim of this study was to assess the attitude and awareness about heart attack symptoms and lifesaving actions among this population.

Subjects and Methods

Study design and time frame: A cross-sectional study was done from April to October 2020.

Study settings: An online survey was done on the population of the Western region in Saudi Arabia

Sampling and population: According to the estimated population of the western region of KSA, a sample size of 385 participants was estimated. The inclusion criteria were adults of both genders who are above the age of 18 years, and the exclusion criteria were all people under 18 years and people outside the Western region.

Data collection procedure: A pre-designed questionnaire was used to collect data. The first section of the questionnaire included items to collect sociodemographic data, having a heart disease, a heart attack in the participant or one of their family and sources of information about heart attack. The second section included knowledge items about heart attack and a one question for attitude "If you decided to change your behavior to reduce your risk of heart attack, how confident are you of changing your behavior?" The third section included items on knowledge about CPR.

Statistical design: The Statistical Package for Social Sciences (SPSS version 25) was used for data analysis. Qualitative data was expressed as numbers and

percentages and quantitative data was expressed as mean and standard deviation (Mean \pm SD), where Mann-Whitney and Kruskal Wallis Tests were applied for non-parametric variables. Spearman's Correlation analysis was done, a p-value of less than 0.05 was considered significant.

Results

Table 1 shows that 82.6% of the participants had an age ranging from 18-49 years, 69.4% were females, 77.1% had a university education, 89.7% had a Saudi nationality, 45.7% were from Jeddah city and 26.5% were working in the medical field. Of the participants, 4.2% had heart disease, 3.7% had a heart attack, 27.9% had a family member who had a heart attack, 13.7% were present when family member had a heart attack and most of them (60.3%) got their information about heart attack from the internet.

Figure 1 shows that 19% and 12% of the participants were very confident and confident that if they decided to change their behavior to reduce their risk of heart attack they would change their behavior.

Table 2 shows that 40% of the participants had heard about heart attacks, or their treatment or prevention in the past year. Of them, 36.4%, 58.7%, 84.5%, 80.8%, and 24.4% knew that "pain or discomfort in jaw, neck, shoulder, arm or back", "feeling weak, lightheaded, faint or sweating", "chest pain or discomfort", "shortness of breath", "nausea and stomach or abdominal pain" were symptoms of heart attack, respectively. Of the participants, 65.5% knew that the first step to take if they witness a person suffering from symptoms of heart attack was to call the ER, 2% knew that on having a heart attack the person should go to a hospital immediately, and most of them (35.2%) knew 6 correct risk factors of heart attack.

Table 3 shows that 30.7% of the participants had attended a CPR course, 14.7% had rescued someone from an emergency, and 20% disagreed that a health practitioner is the only person who can save a patient. About 63% (63.6%) of the participants thought that there is a difference in the method of performing CPR between adults and children under 8 years old, 16.7% knew the correct emergency number in their area, and 61.1% knew that the emergency call is made before starting CPR. Only 30.9% knew how to arrange resuscitation steps in order of priority for an adult, 53.5% knew that the correct way to determine a person's non-response is moving the victim and talking to him: Are you ok?, and 56.3% knew that the best way to check the patient's breathing is to watch his chest whether it rises and comes down, and listens and feels the air coming out of his nose and mouth.

Most of them (83.7%) knew that the best position for a victim when you're doing CPR is lying on solid ground, 69.4% knew that the best way to open the airway before starting to ventilate from mouth to mouth return the head back and lift the chin upwards, and 40.6% knew that if the victim has a composite dental device to leave it in their mouth if it is in the right position.

About 87% of the participants (87.8%) knew that if they are at home and after they call an ambulance to report a heart attack they should open the door and start CPR, 34.2% and 22.8% knew that during CPR the proportion (chest pressure/ventilation) in adults and children is 30 pressures for two ventilations, 39.9% knew that the recovery situation is placing the patient on one side and 80% knew that after hospitals the most common place people have a cardiac arrest is at home.

The mean scores of knowledge regarding heart attack and CPR were 18.46 ± 2.45 and 20.86 ± 2.13 respectively. Table 4 shows that participants who had a university education, who had a medical specialization, were of Saudi nationality, residents of Taif and Makkah city, who had a heart disease themselves or had a heart attack in one of their family and those who had a friend as a source of information had a significant higher mean Knowledge score about heart attack ($p < 0.05$). On the other hand, a non-significant relationship was found between the Knowledge score about heart attack and participants' age, gender and having a previous heart attack ($p > 0.05$).

Table 5 shows that participants with an age ranging from 18-49 years, who had a university education, who had a medical Specialization, were of Saudi nationality, residents of Taif city, who had a previous heart attack and who got their information about heart attack from a doctor, had a significant higher mean Knowledge score about heart attack ($p < 0.05$). On the other hand, a non-significant relationship was found between the Knowledge score about CPR and participants' gender and having a previous heart disease or a previous heart attack in a family member ($p > 0.05$).

Figure 2 shows that a significant positive correlation was found between the knowledge scores about heart attack and knowledge scores about CPR ($r = 0.12$, $p\text{-value} < 0.001$).

Table 1: Distribution of the studied participants according to their characteristics, having heart disease, a heart attack in the participant or one of their family and sources of information (No.: 6113)

Variable	No. (%)
Age	
18-49	5051 (82.6)
≥ 50	1062(17.4)
Gender	
Male	1871 (30.6)
Female	4242 (69.4)
Education	
Uneducated	43 (0.7)
Primary School	36 (0.6)
Intermediate school	144 (2.4)
High school	1177 (19.3)
University graduate	4713 (77.1)
Specialization	
Medical	1622 (26.5)
Non-medical	4491 (73.5)
Nationality	
Saudi	5482(89.7)
Non-Saudi	631 (10.3)
City	
Taif	1289 (21.1)
Makkah	1477 (24.2)
Jeddah	2793 (45.7)
Medina	347 (5.7)
Yanbu	207 (3.4)
Do you have heart disease?	
Yes	259 (4.2)
No	5854 (95.8)
Has anyone in your family ever had a heart attack?	
Yes	1703 (27.9)
No	4410 (72.1)
Have you ever had a heart attack?	
Yes	226 (3.7)
No	5887 (96.3)
Were you present when family member had a heart attack?	
Yes	838 (13.7)
No	5275 (86.3)
Where did you try to get information about heart attack from?	
Internet	3686 (60.3)
Doctor	1485 (24.3)
Friend	942 (15.4)

Figure 1. Percentage distribution of the participants response regarding” If you decided to change your behavior to reduce your risk of heart attack, how confident are you of changing your behavior?”

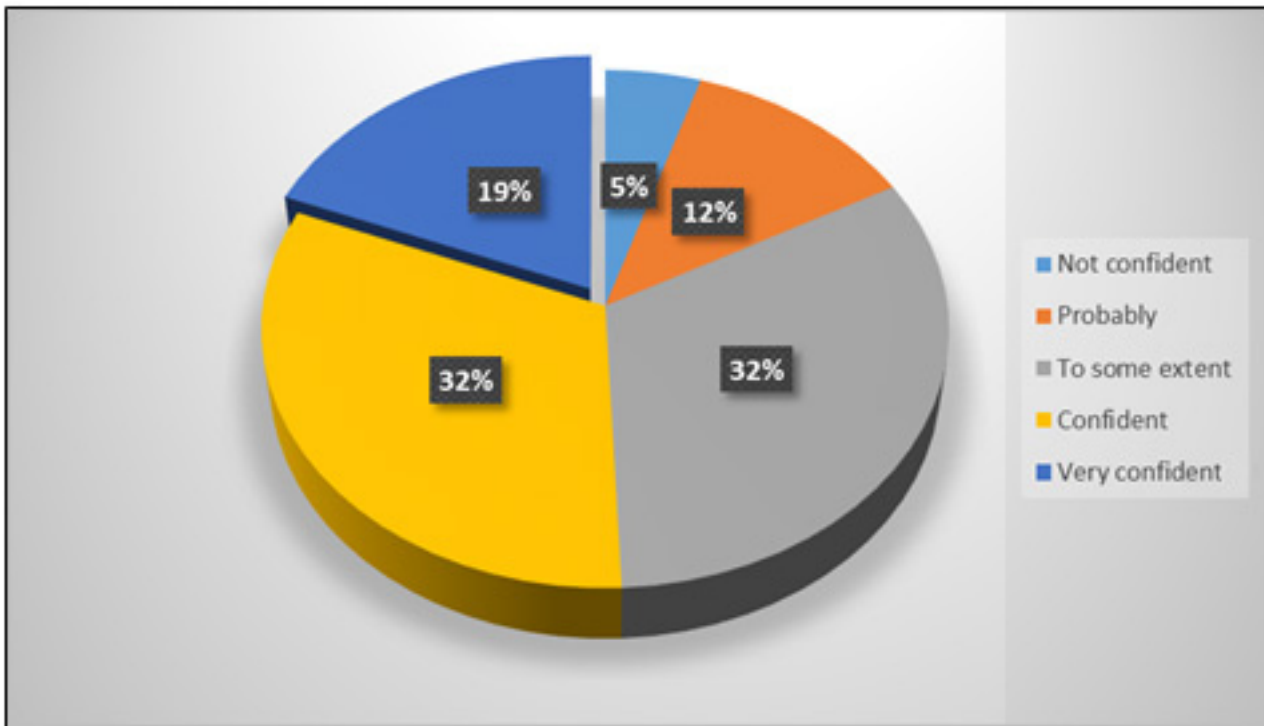


Table 2: Distribution of the studied participants according to their response to knowledge items about heart attack (No.: 6113)

Variable	No. (%)
Have you seen or heard anything about heart attacks, or their treatment or prevention in the past year?	
No	1970 (32.2)
Don't remember	1697 (27.8)
Yes	2446 (40)
Do you think pain or discomfort in jaw, neck, shoulder, arm or back are symptoms of a heart attack?	
No	3889 (63.6)
Yes (Correct answer)	2224 (36.4)
Do you think feeling weak, lightheaded, faint or sweating are a symptoms of a heart attack?	
No	2522 (41.3)
Yes (Correct answer)	3591 (58.7)
Do you think chest pain or discomfort are symptoms for a heart attack?	
No	945 (15.5)
Yes (Correct answer)	5168 (84.5)
Do you think shortness of breath is a symptom of a heart attack?	
No	1171 (19.2)
Yes (Correct answer)	4942 (80.8)
Do you think nausea and stomach or abdominal pain are symptoms of a heart attack?	
No	4619 (75.6)
Yes (Correct answer)	1494 (24.4)
Do you think a heart attack can lead to heart arrest?	
No	712 (11.6)
Yes	5401 (88.4)
What is the first step you take if you witness a person suffering from symptoms of heart attack?	
Lay person down	980 (16)
Give aspirin or nitroglycerin	1131 (18.5)
Call ER (Correct answer)	4002 (65.5)
If you or someone you know were having a heart attack, how quickly would the person need to go to a hospital?	
Immediately (Correct answer)	120 (2)
Same day	42 (0.7)
Next day	235 (3.8)
After your doctor tells you to go	5716 (93.5)
Which health conditions or risk factors increase someone's chances of having a heart attack?: answers were "Overweight, obesity, High blood pressure, High cholesterol, Not exercising, unfit, Smoking, Diabetes mellitus"	
1 correct answer	1016 (16.6)
2 correct answers	602 (9.8)
3 correct answers	960 (15.7)
4 correct answers	707 (11.6)
5 correct answers	677 (11.1)
6 correct answers	2151 (35.2)

Table 3. Distribution of the studied participants according to their response to knowledge items about CPR (No.: 6113)

Variable	No. (%)
Have you ever attended a CPR course?	
No	4234 (69.3)
Yes	1879 (30.7)
Have you ever rescued someone from an emergency?	
No	5214 (85.3)
Yes	899 (14.7)
Do you think a health practitioner is the only person who can save?	
No (<i>Correct answer</i>)	1220 (20)
Yes	4893 (80)
Do you think there is a difference in the method of performing CPR between adults and children under 8 years old?	
No	666 (10.9)
I don't know	1561 (25.5)
Yes (<i>Correct answer</i>)	3886 (63.6)
What is the emergency number in your area?	
997 (<i>Correct answer</i>)	1022 (16.7)
Any other answer	5091 (83.3)
The emergency call is	
Only when you need help	364 (6)
During CPR	1466 (24)
After starting CPR	551 (9)
Before starting CPR (<i>Correct answer</i>)	3732 (61.1)
Arrange resuscitation steps in order of priority for an adult:	
Correct answer "Transferring the victim to a safe place / the casualty response / emergency call / breathing and pulse inspection / opening an air duct / give artificial respiration if no breathing apparatus is present" (<i>Correct answer</i>)	1890 (30.9)
Incorrect answer	4223 (69.1)
The correct way to determine a person's non-response is:	
Earlobe disc	906 (14.8)
Pour cold water on the person	427 (7)
Put something with a strong smell near the nose	1512 (24.7)
Moving the victim and talking to him: Are you ok? (<i>Correct answer</i>)	3268 (53.5)
The best way to check the patient's breathing is:	
Put the hand over his chest and note if it moves with the breathing.	2302 (37.7)
Move a candle to his nose and notice if the flame moves with the breath.	243 (4)
Tickle him and notice his movement and expression	
Watch his chest whether it rises and comes down, and listens and feels the air coming out of his nose and mouth (<i>Correct answer</i>)	128 (2.1)
	3440 (56.3)
What's the best position for a victim when you're doing CPR?	
On a chair	330 (5.5)
In the bathtub	0 (0.0)
Lying on the couch	66 (10.9)
Lying on solid ground (<i>Correct answer</i>)	5096 (83.7)
What is the best way to open the airway before starting to ventilate from mouth to mouth?	
Push the head forward and press the neck	195 (3.2)
Tilt the head to the side and press the larynx	570 (9.3)
Return the head back and press the chest.	1226 (20.1)
Return the head back and lift the chin upwards (<i>Correct answer</i>)	4122 (69.4)

Table 3. Distribution of the studied participants according to their response to knowledge items about CPR (No.: 6113) continued.....

What should you do if the victim has a composite dental device?	
Remove and wash with water and then return it to his mouth	288 (4.7)
Brush it	123 (2)
Take it out of his mouth	3218 (52.6)
Leave it in his mouth if it is in the right position (<i>Correct answer</i>)	2484 (40.6)
You're at home and after you call an ambulance to report a heart attack, what should you do?	
Open the door and wait for the ambulance to come	565 (9.2)
Close the door and wait for the ambulance to come	183 (3)
Open the door and start CPR (<i>Correct answer</i>)	5365 (87.8)
During CPR, what is the proportion (chest pressure/ventilation) in adults?	
10 pressures for one ventilation	2280 (37.3)
20 pressures vs. 5 ventilations	1328 (21.7)
25 pressures for one ventilation	414 (6.8)
30 pressures for two ventilations (<i>Correct answer</i>)	2091 (34.2)
During CPR, what is the proportion (chest pressure/ventilation) in children?	
10 pressures for one ventilation.	3105 (59.8)
20 pressures vs. 5 ventilations.	1139 (18.6)
25 pressures vs. 10 ventilations.	478 (7.8)
30 pressures for two ventilations (<i>Correct answer</i>)	1391 (22.8)
What's the recovery situation?	
When he stands on his feet	211 (3.5)
Lift the legs up at the heart level	2471 (40.4)
Put the patient in a sitting position	991 (16.2)
Placing the patient on one side (<i>Correct answer</i>)	2440 (39.9)
After hospitals, what's the most common place the people have a cardiac arrest?	
Doctors' clinics	555 (9.2)
Mosques.	158 (2.6)
Restaurants	497 (8.2)
Home (<i>Correct answer</i>)	4836 (80)

Table 4: Relationship between the participants' mean knowledge scores about heart attack and their characteristics, having heart disease, a heart attack in the participant or one of their family and sources of information (No.: 6113)

Variable	Knowledge score about heart attack (Mean \pm SD)	Test	p-value
Age 18-49 \geq 50	18.46 \pm 2.43 18.40 \pm 2.54	0.57 ⁺	0.561
Gender Male Female	18.37 \pm 2.57 18.49 \pm 2.4	1.49 ⁺	0.13
Education Uneducated Primary School Intermediate school High school University graduate	16.89 \pm 2.8 17.45 \pm 2.46 17.95 \pm 2.71 18.37 \pm 2.48 18.51 \pm 2.42	4 ^{**}	0.01
Specialization Medical Non-medical	18.97 \pm 2.4 18.27 \pm 2.44	9.74 ⁺	<0.001
Nationality Saudi None-Saudi	18.5 \pm 2.43 18.08 \pm 2.56	3.75 ⁺	<0.001
City Taif Makkah Jeddah Medina Yanbu	18.54 \pm 2.55 18.54 \pm 2.41 18.38 \pm 2.42 18.18 \pm 2.54 18.80 \pm 2.26	4 ^{**}	0.004
Do you have heart disease? Yes No	19.09 \pm 2.52 18.42 \pm 2.44	4.26 ⁺	<0.001
Has anyone in your family ever had a heart attack? Yes No	18.73 \pm 2.4 18.34 \pm 2.46	5.19 ⁺	<0.001
Have you ever had a heart attack? Yes No	18.62 \pm 2.75 18.45 \pm 2.44	0.97 ⁺	0.33
Where did you try to get information about heart attack from? Internet Doctor Friend	18.23 \pm 2.39 18.69 \pm 2.5 18.96 \pm 2.49	2 ^{**}	<0.001

N.B: *Mann-Whitney

**Kruskal Wallis test

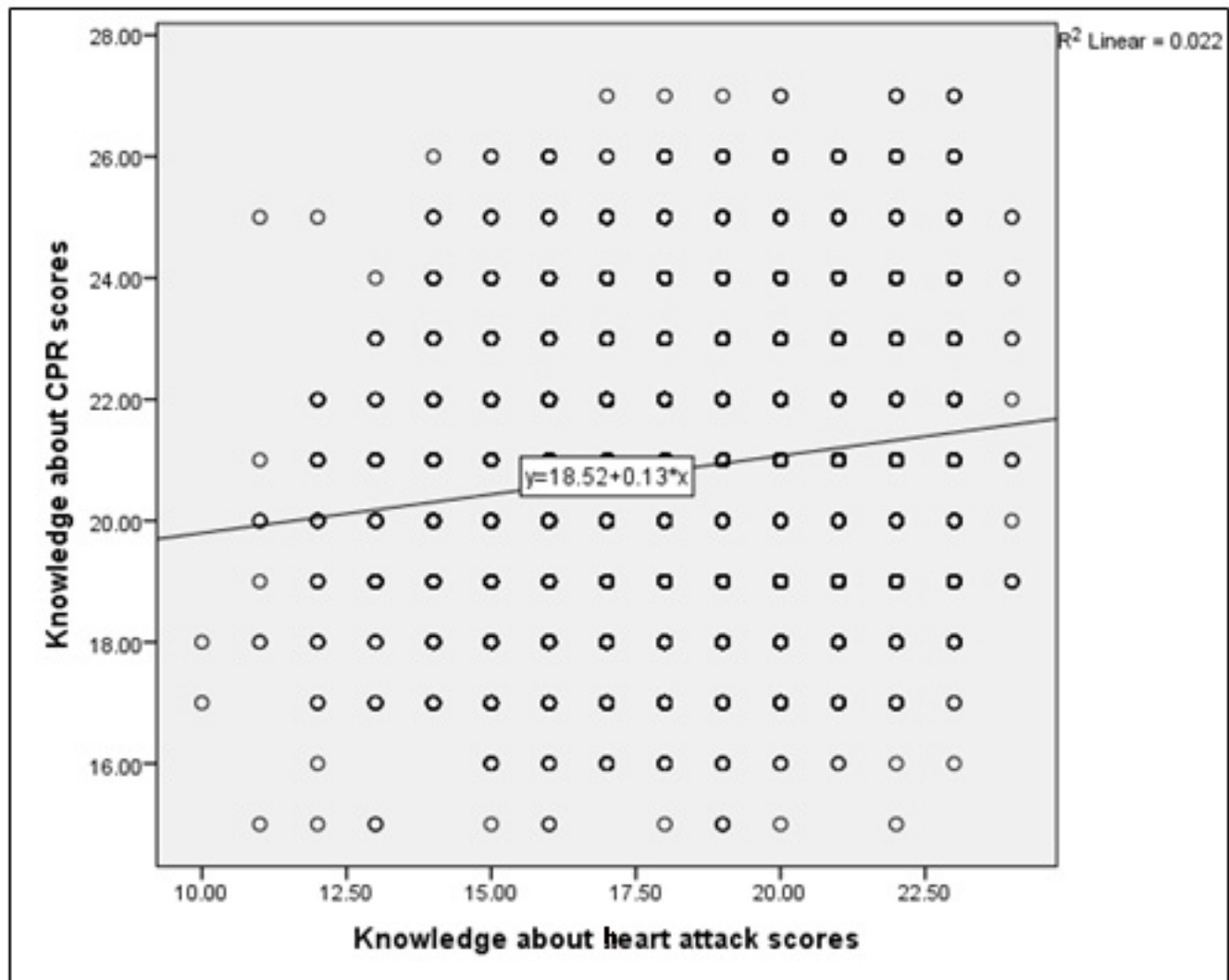
Table 5: Relationship between the participants' mean knowledge scores about CPR and their characteristics, having heart disease, a heart attack in the participant or one of his/her family and sources of information (No.: 6113)

Variable	Knowledge score about CPR (Mean \pm SD)	test	p-value
Age 18-49 ≥ 50	20.96 \pm 2.18 20.36 \pm 1.77	8.23*	<0.001
Gender Male Female	20.82 \pm 2.17 20.87 \pm 2.1	0.42*	0.67
Education Uneducated Primary School Intermediate school High school University graduate	18.86 \pm 1.94 19.5 \pm 2.1 19.84 \pm 1.98 20.56 \pm 2.03 20.99 \pm 2.13	4**	<0.001
Specialization Medical Non-medical	22.11 \pm 2.33 20.41 \pm 1.86	25.5*	<0.001
Nationality Saudi Non-Saudi	20.91 \pm 2.13 20.37 \pm 2	5.79*	<0.001
City Taif Makkah Jeddah Medina Yanbu	21.05 \pm 2.26 20.98 \pm 2.22 20.75 \pm 1.98 20.56 \pm 2.17 20.78 \pm 2.2	4**	<0.001
Do you have heart disease? Yes No	20.90 \pm 2.13 20.85 \pm 2.13	0.48*	0.63
Has anyone in your family ever had a heart attack? Yes No	20.87 \pm 2.02 20.85 \pm 2.17	0.42*	0.67
Have you ever had a heart attack? Yes No	20.37 \pm 2.39 20.88 \pm 2.11	3.67*	<0.001
Where did you try to get information about heart attack from? Internet Doctor Friend	20.71 \pm 1.97 21.55 \pm 2.41 20.33 \pm 1.98	2**	<0.001

N.B: *Mann-Whitney

**Kruskal Wallis test

Figure 2: Spearman's correlation analysis between knowledge scores about heart attack and knowledge scores about CPR



Discussion

The present study was conducted to assess attitude and knowledge regarding heart attack and lifesaving actions. This study showed that the internet was the main source of information about heart attack. Another Saudi study found that the main sources of information on CPR are television and movies (8). In a study done in Jordan, schools and universities are most common sources of information (14). Schools and universities are a more accurate source of information than media but can't cover a large number of people, on the contrary, media may reach the largest number of people in the community (14).

According to our result 40% of the participants knew the symptoms of heart attacks such as chest pain or discomfort, pain in neck, shoulders, jaw or back, dyspnea, altered mental status, nausea and vomiting. Also, this finding is in accordance to studies conducted in Jordan (14) and Turkey (15) which indicated that the highest response rates were for chest pain, respiratory standstill, loss of consciousness and shortness of breath as signs of heart attack.

In the present study, 30.7% of the respondents stated that they had received CPR training, higher than that reported in Jordan 29% (14), Hong Kong (21%) (16) and mainland China (25.6%) (17), and comparable to data reported elsewhere, including 27% in New Zealand (18) and 28% in Ireland (19). The percentage reported in other studies done in Australia (20), Poland (21) and the US (22) were higher, with percentages of 58, 75 and 79%, respectively.

Most of our participants knew that the first step is calling emergency services before starting CPR, but only 16.7% knew the emergency number. Similarly, a study was conducted in Alqssim region which stated that the majority of their students would activate EMS as first step; but half of them did not know the emergency telephone (23). But another study conducted at King Saud University, revealed that 70% of their students knew the Red Crescent telephone number (8). Most of the students of King Saud University realize the importance of this skill, however, 85% still feel that their knowledge is inadequate. This is not that far from the 73% in New Zealand (18). This lack of knowledge resulted in the inability to perform CPR in about half of situations when it was required. In comparison, a US study showed that 9.1% of individuals

did not perform CPR as they felt they would not be able to perform it correctly (24).

In the present study only 16.7% knew the emergency number, a result that agrees with a previous Saudi study where a significant percentage of individuals do not even know the number to call in case of a medical emergency (8). In this work, participants with a university education and who had a medical Specialization had a significant higher mean Knowledge score about CPR. Chair et al. (16) mentioned that people with full-time jobs and higher levels of education were more likely to have received CPR training (16).

Limitations

The main limitation of the present study is being an online survey that can affect the generalization of the study results.

Conclusion

In this study 40% of the participants had heard about heart attacks and 36.4%, 58.7%, 84.5%, 80.8%, and 24.4% knew that “pain or discomfort in jaw, neck, shoulder, arm or back”, “feeling weak, lightheaded, faint or sweating”, “chest pain or discomfort”, “shortness of breath”, “nausea and stomach or abdominal pain” were symptoms of heart attack, respectively. Of the participants, 65.5% knew that the first step to take if they witness a person suffering from symptoms of heart attack was to call the ER. Only 30.7% of the participants attended a CPR course and 14.7% had rescued someone from an emergency and only 30.9% knew how to arrange resuscitation steps in order of priority for an adult.

Participants with a university education, who had a medical specialization, who had heart disease themselves or had a heart attack in one of their family and those who had a friend as a source of information had a significant higher mean Knowledge score about heart attack and CPR. A significant positive correlation was found between the knowledge scores about heart attack and knowledge scores about CPR. The present study demonstrated lack of knowledge regarding important aspects related to both heart attack and CPR. This result demonstrates the importance of raising knowledge about heart attack and training the population in lifesaving action by conducting training courses and awareness campaigns.

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Risk Factors of Cervical Epithelial Cell Abnormality in Baghdad

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Abstract

Knowledge of risk factors associated with cervical epithelial cell abnormality help in tracing cervical cancer incidence. This study aimed at identifying risk factors associated with ECA.

A retrospective case control study was done in the Women cancer Center. All complete patient records from January 2016-July 2019 were reviewed; (2176) women's records were included in the study. Epithelial cell abnormality was found among 508(23.3%). Cervical epithelial cell abnormality was higher among those aged > 45 years 199(39.2%), widowed 9(1.8%) and divorced 4(0.8%). About 102 (20.1%) of those with epithelial cell abnormality had their 1st sexual contact at age < 15 years, in comparison with those with normal cytology 285(17.1%). Post coital bleeding as a presenting symptom was higher among those with ECA 105(20.7%). Bivariate logistic analysis showed significant relation with age groups of 45 years or older (Adjusted odds ratio (AOR) 1.4, 95 % CI: 1.1 – 1.81.), post coital bleeding (AOR 1.92, 95 % CI: 1.1 – 3.43). A high percentage of women had ECA. The most common risk factors were age older than 45 years, the first sexual contact at age < 15 years, and high parity >3, and post coital bleeding.

Key words: cervical cancer, clinical presentation of ECA, Epithelial cell abnormality, Risk factors, Pap Smear.

Introduction

Cervical cancer [CC] is the 2nd leading cause of cancer morbidity and the 4th leading cause of cancer death among women globally; the majority of cases occur in developing countries [1].

In Iraq the incidence rate of cervical cancer is 2.1 per 100,000 population [2], while the ECA prevalence was (23.2%) [3]. Cervical cancer screening decreased the incidence of invasive cervical cancer to 50% of previously reported levels [4].

Cervical epithelial cell abnormality (ECA) is a term that refers to a sequence of cervical abnormality ranging from mild to severe Squamous intraepithelial dysplasia to invasive squamous cell carcinoma [5].

The precursor lesions gradually develop to invasive cancer [6]. Not all precursor lesions will progress to invasive cancer; many of the mild and moderate lesions may regress [1]. On a global level, 75% of women have abnormal cervical cytology at least once in their life time which may progress to cervical cancer. The cytological changes which appear in pre-invasive lesions are nuclear enlargement, multinucleation, hyperchromasia with thin cytoplasm and perinuclear halo, in addition to koilocytotic atypia [7].

Abnormal growth of squamous epithelial cells of the ectocervix is known as Squamous intraepithelial lesions (SIL). A spectrum of SIL that lies along the footpath (mild, severe dysplasia and invasive cancer) is known as cervical epithelial cell abnormalities (ECA) [1]. Precursor lesions develop gradually to form cervical carcinoma [1]. Greater than 99.7% of cervical cancer is attributed by human papillomavirus (HPV) infection.

Multiple risk factors are associated with CC. These include: age of 30-55 years, socioeconomic status, smoking, abnormal Papanicolaou (Pap) smears, HPV infection and vaginal inflammatory changes, number of previous pregnancies, [8] number of sexual partners, and age at first intercourse [9]. About 6% of CC reported using of barrier methods of contraception (condom and diaphragm) [10]. Women diagnosed with cervical intraepithelial neoplasia grade 3 had an accelerated increased risk of acquiring invasive cancer [11].

Pap smear screening test is the method of preventing CC. The danger of CC development was reduced by early detection of cervical cell abnormalities. This is due to timely response to abnormal changes in cervical cytology [12].

Few reports have described the frequency and pattern of abnormal Pap smears in developing countries [13] and in Iraq [14, 15]. No researcher in Iraq has studied the risk factors associated with ECA. This study aimed to determine the associated risk factors for an abnormal pap smear cytology. The knowing of associated risk factors helps in prevention strategies implementation.

Patients and methods

A retrospective case control study was done in Al-Alwiya Maternity Teaching Hospital, Women cancer Center. Patient records from January 2016-July 2019 were reviewed and those with complete information were selected. A total of 2,176 women's records were included in the study, 1,668 with normal cytology compared with 508 cases with abnormal cytology.

Al-Alwiya Maternity Teaching Hospital, Women cancer Center, is one among the main cervical cancer early detection centers, and drains areas of the Al Rusafa part of Baghdad city, as well as some patients referred from the Salahaddin and Al Anbar governorates.

Excluded was any record with incomplete information, or without Pap Smear cytology results. The spatula with the sample was rapidly but lightly stroked, thinly and evenly across the surface of the slide and cytology spray fixatives were used without delay. All slides were evaluated at the cytology laboratory of the hospital using light microscopy. Smears were prepared by cytotechnologists and every slide was read by the consultant cytopathologist.

Socio-demographic data, age, marital status, age at marriage and gynecological and obstetrical history was obtained from the records.

Results

Epithelial cell abnormality was found among 508(23.3%) of the total sample of 2,176 patients.

Cervical epithelial cell abnormality (ECA) was higher among those aged > 45 years 199(39.2%), while most of those with normal cytology were aged 34-45 years 653(39.1%). This relation was statistically not significant.

Marital status analysis showed that widowed 9(1.8%) and divorced 4(0.8%) were among those who had epithelial cell abnormality higher than those among normal epithelial cytology 18(1.1%), 8(0.5%) respectively. This relationship was not statistically significant.

About 102 (20.1%) of those with epithelial cell abnormality had their first sexual contact at age < 15 years, in comparison with those with normal cytology at the same time of sexual contact 285(17.1%) This relation was statistically not significant, as shown in Table 1.

Post coital bleeding as a presenting symptom was higher among those with ECA 105(20.7%), while it was lower among those with normal epithelial cell cytology 245(14.7%).

Bivariate logistic analysis showed that the prevalence of ECA was significantly higher among patients within the age groups of 45 years or older (Adjusted odds ratio (AOR) 1.4, 95% CI: 1.1 – 1.81, p = 0.027) as compared to women aged < 34 years. Age at marriage, status of marriage, and parity was not associated with increased

Table 1: The relation of Pap smear test results and different patient characteristics.

		Pap smear results		Total	P value
		Normal	Epithelial cervical abnormality		
Age	<34	436	118	554	0.157
		26.10%	23.20%	25.50%	
	34-45	653	191	844	
		39.10%	37.60%	38.80%	
	>45	579	199	778	
		34.70%	39.20%	35.80%	
Marital status	Married	1642	495	2137	0.331
		98.40%	97.40%	98.20%	
	Widow	18	9	27	
		1.10%	1.80%	1.20%	
	Divorced	8	4	12	
		0.50%	0.80%	0.60%	
Marriage age	<15	285	102	387	0.261
		17.10%	20.10%	17.80%	
	15-18	415	116	531	
		24.90%	22.80%	24.40%	
	>18	968	290	1258	
		58.00%	57.10%	57.80%	
Parity	<2	361	98	459	0.5
		21.60%	19.30%	21.10%	
	3-4	471	151	622	
		28.20%	29.70%	28.60%	
	>4	836	259	1095	
		50.10%	51.00%	50.30%	

risk of ECA. Post coital bleeding was associated with increased risk of ECA (AOR 1.92, 95 % CI: 1.1 – 3.43, $p = 0.028$), the crude OR was significantly higher among those who presented with post coital bleeding as compared to the screening 1.8, 95 % CI: (1.01-3.2, $p = 0.048$)

Discussion

Little has been written about the correlation of presenting symptoms of the patient with cytological abnormality of the cervix in Iraq, therefore it is important to know the most prevalent risk factors to predict the risk of cervical ECA. Epithelial cell abnormality was found among 508(23.3%); this goes with that reported previously in Iraq [15] and Ethiopia (16.4 %) [16].

This was lower than the figure reported in Baghdad by Abdulla K N et al (86%), [17] and Aloan H.H, and Issa Z.A. (85.4) [18]. This difference is due to the difference in selection of the sample as they selected only symptomatic patients and those in need of colposcopy, resulting in a higher prevalence of cervical ECA.

Cervical epithelial cell abnormality (ECA) was higher among those aged > 45 years (39.2%). This was supported by previous studies that showed increased prevalence and grade of ECA with increasing age, mostly women aged >45 years (46.04%). Patients older than 40 years had the greatest incidence of invasive cancer [19]. Prevalence of high-grade lesions was high and not surprisingly was commonly seen in older age group women [20].

EI. Mahalli Azza Ali found that mean age for those with (ECA) (45.97 ± 8.012) was higher than with normal cytology (42.25 ± 10.047), and patients of age (40-50 years), had the highest prevalence of ECA (52.4%), and for those above 50 years it was (26.9%) [21].

The adjusted logistic regression showed that those aged > 45 years had significantly higher risk of ECA(OR=1.4) This is supported by Shield's et al., (2004) who showed that risk of developing CC was high among patients aged (35-44), (45-54), and (≥ 55) with OR = 1.2, 1.7 and 1.5 respectively [22].

Table 2: The relation of Pap smear cytology results and presenting symptoms

Presenting symptom	Normal	Epithelial cervical abnormality	Total
Screening	71	17	88
	4.30%	3.30%	4.00%
Vaginal discharge	884	261	1145
	53.00%	51.40%	52.60%
Abdominal pain	32	10	42
	1.90%	2.00%	1.90%
Irregular vaginal bleeding	311	71	382
	18.60%	14.00%	17.60%
Post coital bleeding	245	105	350
	14.70%	20.70%	16.10%
Post-menopausal bleeding	83	26	109
	5.00%	5.10%	5.00%
Other	42	18	60
	2.50%	3.50%	2.80%
Total	1668	508	2176
	76.70%	23.30%	100.00%

Chi-Square= 15.9, df=6, P value <0.014

Table 3: Bivariate analysis of risk factors for cervical ECA among women attending cervical cancer screening unit

		AOR (95% C.I.)	95% C.I.		P value
			P value	COR (95% C.I.)	
Age	<34	1		1	
	34-45	1.1(0.8-1.44)	0.476	1.1(0.8-1.4)	0.5
	>45	1.4(1.1-1.81)	0.027	1.3(0.98-1.6)	0.07
Age at marriage	>18	1		1	
	15-18	0.9(0.73-1.2)	0.568	0.9(0.7-1.2)	0.578
	<15	1.2(0.9-1.6)	0.17	1.2(0.9-1.6)	0.182
Parity	<2	1		1	
	3_4	1.17(0.9-1.6)	0.297	1.2(0.9-1.6)	0.259
	>4	1.1(0.8-1.4)	0.518	1.14(0.8-1.5)	0.325
Marital status	Married	1		1	
	Widow	1.73(0.8-3.9)	0.196	1.7(0.7-3.7)	0.219
	Divorced	1.6(0.4-5.3)	0.468	1.65(0.5-5.5)	0.410
Presenting symptom	Screening	1		1	
	Vaginal discharge	1.3(0.75-2.3)	0.348	1.23(0.7-2.1)	0.453
	Abdominal pain	1.4(0.6-3.3)	0.484	1.31(0.5-3.2)	0.556
	Irregular vaginal bleeding	0.95(0.53-1.7)	0.875	.95(0.5-1.7)	0.874
	Post coital bleeding	1.92(1.1-3.43)	0.028	1.8(1.01-3.2)	0.048
	Post-menopausal bleeding	1.1(0.5-2.2)	0.816	1.31(0.6-2.6)	0.444

This study found that those with high parity 3-4 or > 4 pregnancies had higher prevalence of ECA while the logistic regression showed a non-significant relation between ECA by Pap smear and parity of > 3 full term deliveries. This goes along with Munoz et al., (2002) who reported that high parity is a risk factor for developing CC (OR in women who had ≥ 7 full term pregnancies was 3.8) [23]. In addition, the Alliance for Cervical Cancer Prevention reported in their 'Risk Factors for Cervical Cancer: Evidence to Date' that women with (3 or 4) full term pregnancies had 2.6 times the risk of developing CC than nulliparous women [24]. The American Cancer Society reported 'Women who have had 3 or more full-term pregnancies have an increased risk of CC' [25]. These figures go with the present findings where patients who had ≥ 3 pregnancies were at higher risk of developing CC.

The real reason for this fact is not known. One theory states that these women may have had more exposure to HPV infection due to having unprotected intercourse. Other studies have attributed this to hormonal changes during pregnancy, as it makes women more vulnerable to HPV infection or cancer development. A further thought is that the weaker immune system during pregnancy allows contracting of HPV infection and cancer growth [25]. The lower and non-significant OR in this study may be explained by the cultural difference in Islamic countries in which most of women are restricted to one partner and have restricted use of family planning which can confound the relation or may be prove the fact that multiple partners increase risk of HPV which is the main cause of cervical cancer, therefore, further studies should investigate why this risk factor increases the likelihood of developing abnormal cervical cytology.

Marital status analysis shows that widows (1.8%) and the divorced (0.8%) among those who had epithelial cell abnormality was higher than those among normal epithelial cytology (1.1%) and (0.5%) respectively.

About 102 (20.1%) of those with epithelial cell abnormality had their first sexual contact at age < 15 years, in comparison with those with normal cytology at the same time of sexual contact 285(17.1%) with an AOR of 1.2 compared with those whose first sexual intercourse was at age > 18 years old. This finding is supported by findings of Louie, K., et al [26], Compared with women with >1 years, OR was 1.80 (95% CI: 1.50–2.39). The process by which the first sexual contact could influence the cervical carcinogenesis risk may be clarified by the effect of steroid during adolescence on HPV infection and host's immunity. The transformation zone of the cervical epithelium is the site in which dysplastic changes tend to occur as a result of HPV infection. Stripping of the stratified epithelium in this area increases susceptibility and facilitates the exposure of the basal layer to HPV with minimal trauma. The acidification of vaginal cavity which is stimulated by the high levels of oestrogen during adolescence, play a role in squamous metaplasia. HPV infection during these metaplastic changes increase risk of cell transformation, and neoplastic changes [27,28].

The common presenting symptom among those with ECA was vaginal discharge (51.4%), and post-coital bleeding (20.7%), and irregular vaginal bleeding (14%) This figure was higher than that found by Shapley M (11%) [29]. Srivastava S, [30] found that the most prevalent clinical finding was abnormal vaginal discharge (13.4 %). Vaginal discharge is usually a normal and regular evidence; the type of discharge may suggest an underlying infective cause. Such abnormal discharge was considered when the vaginal discharge was yellow or green in color, chunky in consistency, and having a foul odour. Most abnormal discharges in the study were caused by yeast or bacterial infection.

The prevalence of PCB among those with abnormal cytology was 20.7%. This was higher than that found in India 6.7% [30]. The crude logistic regression was 1.8, and adjusted OR was 1.9 for post coital bleeding. This goes with previous studies that reported increased probability of cancer among patients with postcoital bleeding [15,16,29].

From the above we noted that all risk factors indirectly affect the ECA development through increasing the susceptibility to HPV infection. This fact makes the effect of these risk factors lower in countries with lower HPV prevalence. More research is needed to evaluate the effect of these risk factors in Middle East countries and communities with low prevalence of HPV infection.

Conclusions and Recommendations

Epithelial cell abnormalities were high (23.3%). The most common risk factors were >45 years, post coital bleeding, the first sexual contact at age < 15 years, widowed and divorced, and high parity >3. Attention should be paid to patients presenting with post coital bleeding and should be sent for Pap smear examination.

Ethical consideration and acknowledgment:

No ethical concerns were present. The study was approved by the research ethics Committee of Rusafa health directorate. We acknowledge all the patients and staff of women cancer center for their cooperation and help.

Conflict of interest

There is no conflict of interest except for increase the knowledge and research quality regarding cervical cancer.

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Patterns of Contact Lenses Use among female Students at Health Colleges of King Khalid University at Abha, KSA

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Abstract

Objective: to assess how much female students at King Khalid University (KKU) use contact lens and to assess their practices and care of contact lenses.

Methods: A cross-sectional study included 751 female students at Health Colleges of KKU. A self-administrated questionnaire was designed.

Results: Two-thirds (66.2%) used contact lenses, mainly soft lenses (82.7%) and for cosmetic reasons (23.3%) and to correct errors of refraction (29.4%). (56.5%) of participants used contact lenses for 4-7 hours daily. (55.7%) of participants obtained their contact lenses from an optician. More than one third of participants disagree or strongly disagree regarding the importance to consult an ophthalmologist when choosing contact lenses, while 64.2% recommend others to use contact lenses. Most participants (95.8%) clean their contact lenses with a solution. Most participants always remove contact lenses before sleep (89.3%) or swimming (82.3%). (55.9%) do not visit an ophthalmologist for follow up care of their contact lenses.

Conclusions: Most students used them for cosmetic purposes. They mostly obtain them from opticians. Their awareness is suboptimal and lacks proper practice. Their awareness and practice should be increased.

Key words: Contact lenses, female university students, care of lenses, awareness, attitude, practices.

Background

Contact lenses are considered as one of the optical devices worn on the eye, placed directly on the surface of the cornea [1]. The popularity of contact lenses continues to increase with regular improvement in materials and variants suitable for a variety of users [2]. The ideal contact lens for refractive errors has been difficult to find with reports of complications with even the most advanced systems available [3]. Modern studies have shown the use of contact lenses for refractive error correction to be higher and more abundant among the younger strata of the population [4].

Improper use and deficient care of contact lenses may lead to an infection and inflammation of cornea or conjunctiva by different types of microorganisms in the presence of reduced tissue resistance [5]. Complications most commonly correlated with use include dry eye, giant papillary conjunctivitis, corneal abrasion, corneal edema, corneal ulcer, keratitis and neovascularization [6]. The awareness of these complications was found lacking amongst the younger users, and 87% of these users preferred contact lens use in spite of the ocular problems related to their use [7]. Cosmetic benefits and convenience were the most common reasons cited for contact lenses use [8].

One of the major factors that causes contact lens complications is noncompliance to the practitioner's instructions on the use of contact lenses and care products [9]. Problems caused by wearing contact lenses can be prevented by ocular health education, especially knowledge in the right and careful practice related to contact lenses. A person's conception regarding their knowledge and practice of wearing contact lens can be assessed [10].

Aim of study

The aim of the present study was to assess prevalence of female students at King Khalid University using contact lenses and to assess their practices regarding care of contact lenses.

Methods

A cross-sectional study was carried out during the academic year 2019 among 751 female university students at Health Sciences Colleges of King Khalid University. A structured self-administrated questionnaire with close-ended questions was designed by researchers in simple Arabic language and was used to collect data. It included the following:

1. Personal characteristics of the students.
2. Questions to assess awareness and use regarding contact lenses, reasons for and duration of use.

The validity of the study tool was assessed by a family medicine consultant. A pilot study was conducted on 15 students whose responses were not included in the main study. The objective of the pilot study was to test the clarity of questions included in the study tool and to assess the time needed for filling in the questionnaire.

Students were directly interviewed by the researchers during their free time as organized by the college administration. Questionnaire sheets were distributed to participant students and then were collected immediately after being filled.

Collected data were coded, entered into a computer and analyzed using the Statistical Package for Social Sciences (IBM-SPSS version 22). Descriptive statistics (frequency, and percentage) were applied.

Results

Table (1) shows that the age of most participant female students ranged from 20-24 years (76.6%), 11.2% were <20 years old and 12.3% were >25 years old. The academic year of 29.3% of participants was first/second, that of 31.6% was third-fourth and that of 22.9% was fifth-sixth, while interns constituted 16.1% of participants. About one third of participants (34.9%) were medical students, while the college of 27.4% was Applied Medical Sciences, that of 15% was Pharmacy, that of 10.7% was Nursing, and that of 9.9% was dentistry. Average duration of study times was mainly more than 2 hours/day (41.9%), while that of 33% was 1-2 hours/day. More than half of participants (56.7%) had errors of refraction, mainly as myopia (31.3%). Almost half of participants (46.6%) preferred using contact lenses for improving their visual acuity. The mass media was the main source of information for participants about contact lenses (43.8%), followed by family members (31%), and lastly physicians (25.2%).

Figure (1) shows that almost two-thirds of participant students (66.2%) used contact lenses.

Table (2) shows that, among 497 participant students who use contact lenses, 82.7% used soft lenses. Multiple usage lenses were used by 88.3% of participants. Almost half of participants (47.3%) use contact lenses to correct errors of refraction, while 23.3% use contact lenses cosmetically and 29.4% use lenses cosmetically and to correct errors of refraction. More than half of participants (51.7%) use contact lenses for more than 6 months, and 71.9% used contact lenses for more than 2 years. More than two-thirds of participants (68.4%) used lenses on special occasions, while 20.3% used lenses daily. More than half of participants (56.5%) used contact lenses for 4-7 hours daily, while 16.5% use contact lenses 8-12 hours daily and 9.7% use contact lenses >12 hours daily. More than half of participants (55.7%) obtained their contact lenses from an optician, 16.9% obtained their contact lenses from a beauty center.

Table (3) shows that the most frequently stated complications of contact lenses were red eyes, allergy and corneal ulcers (85.1%, 53.1% and 38.2%, respectively).

Table (4) shows that more than one third of participants disagree or strongly disagree regarding the importance to consult an ophthalmologist when choosing contact lenses (18.5% and 19.9%, respectively), while 64.2% recommend others to use contact lenses.

Table (5) shows that the majority of participants (95.8%) clean their contact lenses with a solution. About half of participants (50.9%) clean their contact lenses only while in use, and 80.7% wash their hands before using contact lenses. Most participants always remove contact lenses before sleep (89.3%) or swimming (82.3%). About two-thirds of participants (67.2%) change their contact lenses twice per year. More than half of participants (55.9%) do not visit an ophthalmologist for follow up care of their contact lenses.

Table 1: Personal characteristics of participants

Personal characteristics	No.	%
Age groups		
• <20 years	84	11.2
• 20-24 years	575	76.6
• ≥25 years	92	12.3
Academic year		
• First-Second	220	29.3
• Third-Fourth	238	31.6
• Fifth-Sixth	172	22.9
• Intern	121	16.1
College		
• Medicine	262	34.9
• Dentistry	74	9.9
• Applied Medical Sciences	206	27.4
• Pharmacy	113	15.0
• Nursing	80	10.7
• Others	16	2.1
Average duration of study times		
• <30 minutes/day	68	9.1
• 30-60 minutes/day	120	16.0
• 1-2 hours/day	248	33.0
• >2 hours/day	315	41.9
Having Error of refraction		
• No	325	43.3
• Yes:	426	56.7
• Myopia	235	31.3
• Hypermetropia	19	2.5
• Astigmatism	43	5.7
• Myopia with astigmatism	129	17.2
Preferred method for improving visual acuity		
• Glasses	401	53.4
• Contact lenses	350	46.6
Undergoing surgery to improve visual acuity	41	5.5
Sources of information on contact lenses		
• Family	233	31.0
• Mass media	329	43.8
• Physicians	189	25.2

Table 2: Characteristics of used contact lenses (n=497)

Characteristics	No.	%
Type of used contact lenses		
• Soft	411	82.7
• Hard	86	17.3
Frequency of contact lenses usage		
• Single usage	58	11.7
• Multiple usage	439	88.3
Reasons for use of contact lenses		
• Cosmetic	116	23.3
• To correct errors of refraction	235	47.3
• Cosmetic and for correction	146	29.4
Use of contact lenses for more than 6 months	257	51.7
For how long you have been using contact lenses		
• <6 months	30	6.0
• 6-12 months	57	11.5
• 1-2 years	102	20.5
• > 2 years	308	71.9
Occasions for using contact lenses		
• Daily	101	20.3
• Weekly	56	11.3
• Special social occasions	340	68.4
Duration of daily use of contact lenses		
• <4 hours	86	17.3
• 4-7 hours	281	56.5
• 8-12 hours	82	16.5
• >12 hours	48	9.7
Sources for obtaining contact lenses		
• Beauty center	84	16.9
• Glasses shop (optician)	277	55.7
• Hospital	13	2.6
• Online purchase	72	14.5
• Others	51	10.2

Figure 1: Prevalence of using contact lenses among students of Health Sciences Colleges at King Khalid University

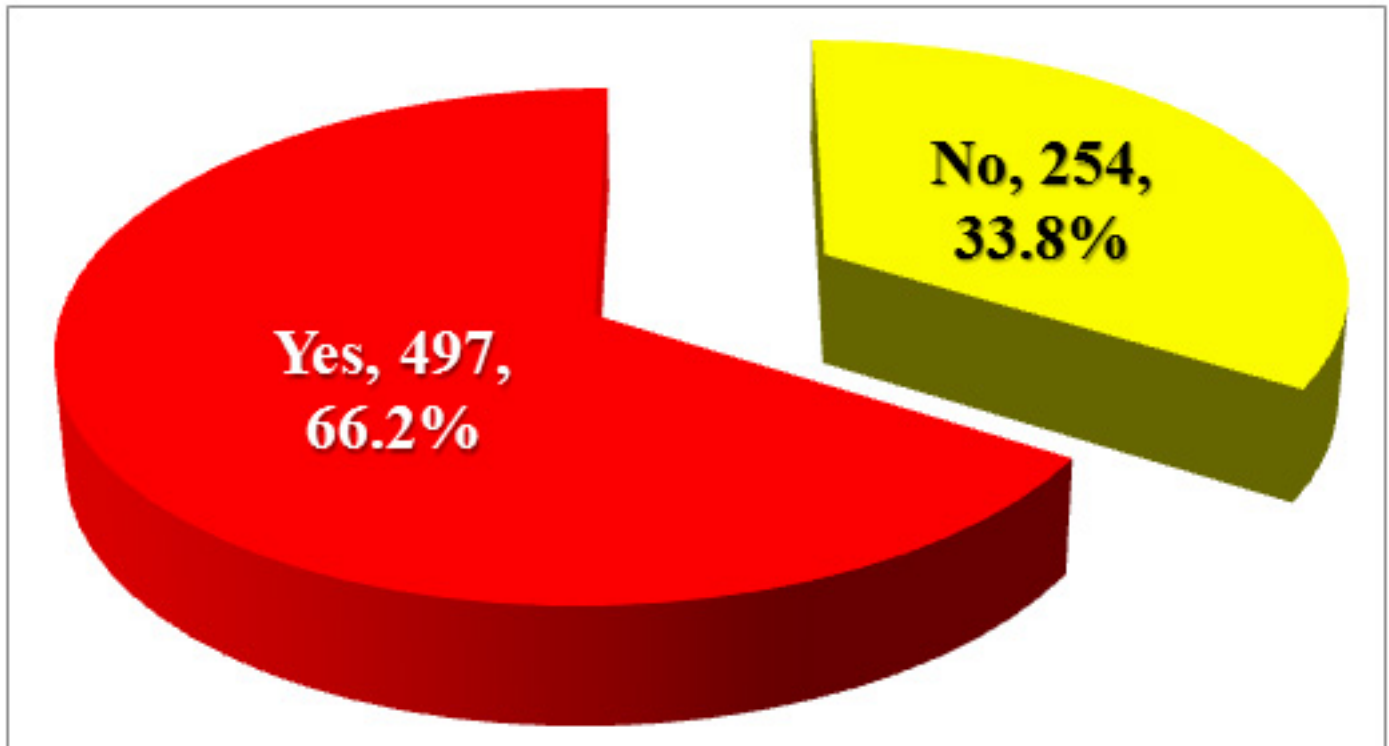


Table 3: Participant students' awareness regarding complications of using contact lenses (n=497)

Complications	Yes		No		Do not know	
	No.	%	No.	%	No.	%
Allergy	264	53.1	70	14.1	163	32.8
Conjunctivitis	166	33.4	92	18.5	239	48.1
Red eyes	423	85.1	32	6.4	42	8.5
Corneal opacity	146	29.4	100	20.1	251	50.5
Loss of vision	157	31.6	138	27.8	202	40.6
Corneal ulcers	190	38.2	100	20.1	207	41.6

Table 4: Participant students' attitude toward choosing and using contact lenses (n=497)

Attitude	No.	%
It is important to consult an ophthalmologist when choosing contact lenses		
• Strongly agree	123	24.7
• Agree	183	36.8
• Disagree	92	18.5
• Strongly disagree	99	19.9
Recommending others to use contact lenses?		
• Yes	319	64.2
• No	178	35.8

Table 5: Participant students' activities for care of contact lenses (n=497)

Activities	No.	%
What do you use to clean your contact lenses?		
• Water	21	4.2
• Solution	476	95.8
Cleaning contact lenses		
• Always	120	24.1
• Sometimes	105	21.1
• Rarely	19	3.8
• Only while use	253	50.9
Washing hands before using contact lenses		
• Yes	401	80.7
• No	14	2.8
• Sometimes	82	16.5
Removing contact lenses before sleep		
• Yes	444	89.3
• No	4	0.8
• Sometimes	48	9.9
Removing contact lenses before swimming		
• Yes	409	82.3
• No	33	6.6
• Sometimes	55	11.1
Rate of changing contact lenses		
• Daily	23	4.6
• Weekly	11	2.2
• Biweekly	9	1.8
• Monthly	105	21.1
• Biannually	334	67.2
• Annually	15	3.0
Visiting an ophthalmologist for follow up care of contact lenses		
• Biweekly	3	0.6
• Biannually	57	11.5
• Annually	159	32.0
• I do not	278	55.9

Discussion

Findings of this study showed that about two-thirds of female students at Health Sciences Colleges of King Khalid University used contact lenses, mainly of the soft type, for multiple usage for more than two years. More than half of students use contact lenses either cosmetically or cosmetically and to correct errors of refraction. Moreover, most participants wear their contact lenses only during special social occasions. For errors of refraction, contact lenses were used mainly to correct myopia, which was prevalent among 31.3% of participants.

These findings are in accordance with those reported by Abahussin et al. [11], who reported that 70.2% of Saudi female university students in Riyadh City used contact lenses for different purposes, mainly cosmetic reasons (63.3%) or refractive purposes (19.1%). Similarly, Maqsood and Algalban [12] found that female students at King Saudi University, in Saudi Arabia used soft contact lenses, mainly for cosmetic purposes (68%).

Almost half of participants in the present study preferred using contact lenses for improving their visual acuity and about two-thirds recommended others to use contact lenses.

Abokyi et al. [13] stated that despite advancement in surgical refractive corrective procedures, corrective eyewear, including contact lenses, remains the most popular modality for vision correction even in developed countries. Contact lens wearers report better quality of life than spectacle wearers [14-15].

The present study revealed that awareness of most university students regarding contact lenses and the complications associated with their use was suboptimal.

Kumar and Preetha et al. [16] stated that raising awareness of the population toward proper use of contact lens is a very important determinant of the health behavior of an individual, and, therefore, health education is regarded as an effective tool for health promotion.

Results of several studies in different populations consistently reported poor awareness regarding contact lenses. Abokyi et al. [13] found that about two-thirds of spectacle wearers in Ghana were unaware of proper contact lens wear. In Nigeria, Ayanniyi et al. [17] reported that more than half of the study population were poorly aware about contact lenses. Also, in Iran Saber et al. [18] reported poor awareness of contact lenses among most study participants.

Findings of the presents study showed that more than one third of participants do not agree that it is important to consult an ophthalmologist when using contact lenses. Moreover, participants' improper practices regarding contact lens care were common, e.g., more than one-quarter of participants use their contact lenses for 8 hours or more, about half of participants clean their contact

lenses only while in use, only 80.7% wash their hands before using contact lenses, only two-thirds of participants change their contact lenses twice per year and more than half of participants do not visit an ophthalmologist for follow up care of their contact lenses.

These findings are in accordance with those reported by Maqsood and Algalban [12], who found that most female students at King Saud University wear contact lenses for 8-12 hours or more daily, while 73% used to replace their contact lenses with new ones as per the schedule according to the manufacturer, 27% were not following the time schedule of replacing the soft contact lenses, 59% wash their hands before handling the contact lenses and 45% clean their contact lenses according to the instructions.

Maqsood and Algalban [12] emphasized that the lack of proper practice regarding care of contact lenses may increase the risk of complications associated with wearing and improper cleaning of contact lens which can lead to eye problems. Therefore, the awareness and practices regarding contact lenses care should be increased by all contact lens providers so that the prevalence of eye complications associated with wearing contact lenses can be minimized.

It is to be noted that most participants in the present study obtained their contact lenses from opticians , online purchase, or a beauty center.

Abahussin et al. [11] stated that 80.2% of stores that sell contact lenses in Saudi Arabia dispense contact lenses without a prescription, since over-the-counter obtaining of contact lenses is not illegal. However, it is considered a federal offence in certain countries [19]. Therefore, to minimize this unhealthy practice, the Saudi Food and Drug Agency should take the necessary steps to ensure that contact lenses are strictly dispensed by eye care practitioners at authorized shops after verifying the patient's prescription.

Conclusions

Most female Health Sciences college students at King Khalid University used contact lenses, mainly for cosmetic reasons, especially at social occasions. Although they mostly agree regarding the importance to consult an ophthalmologist when choosing contact lenses, they mostly obtain contact lenses from opticians , online purchase, or a beauty center. Their awareness regarding contact lenses is suboptimal and most of them lack proper practices regarding care of contact lenses. Therefore, their awareness and practices regarding contact lenses care should be increased by all contact lens providers.

Abbreviation:

King Khalid university (KKU), Research ethical committee (REC)

Declarations:**Ethics approval and consent to participate:**

Informed consent was obtained from all residents prior to data collection. All the selected respondents were given assurance of confidentiality that the information gathered will be used exclusively for research purposes. This study was approved by the Institutional Review Board of King Khalid university (KKU) (Reference #:(ECM#2019-56)-(HAPO-06-B-001). All necessary official approvals to conduct this study were obtained.

Consent for publication: Not applicable.

Availability of data and materials:

The data that support the findings of the current study are available from the corresponding author on reasonable request.

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Factors associated with failure of exclusive breastfeeding among mothers of twins in Saudi Arabia

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Abstract

Objective: To assess prevalence of exclusive breastfeeding practices and risk factors for failure to fulfill exclusive breastfeeding for twins delivered in Saudi Arabia.

Methods: Following a comparative case-control study design in Saudi Arabia, this study comprised 178 mothers who delivered twins and 122 mothers who delivered singleton babies. The researcher developed a self-administered questionnaire in simple Arabic language. The questionnaire included questions regarding personal characteristics of the mothers, breastfeeding practices of the baby, and questions about mothers' confidence toward their ability to exclusively breastfeed their babies.

Results: Caesarian delivery was significantly more among mothers of twins than mothers of singleton babies (79.5% and 35.4%, respectively, $p < 0.001$). Admission to neonatal intensive care units was significantly more among twin babies than singleton babies (60.7% and 18.5%, respectively, $p < 0.001$). Number of children (5 or more) was significantly more among mothers with twins than those with singletons (16.4% and 4.5%, respectively, $p < 0.001$). Mothers in both study groups did not differ significantly according to their employment status, residence, and family monthly income. Significantly less twin, than singleton babies started breastfeeding during the first 6 hours after birth (48.4% and 73%, respectively, $p < 0.001$). There were significantly less twin than singleton babies who were exclusively breastfed (46.7% and 79.2%, respectively, $p < 0.001$). Exclusive breastfeeding was significantly more practiced by mothers whose children were not

admitted to neonatal intensive care units (NICU) than those whose children were admitted to NICU (64.6% and 35.1%, respectively, $p = 0.001$). Exclusive breastfeeding was also significantly more practiced by mothers whose children started breastfeeding within the first 6 hours than those who started breastfeeding after 6 hours ($p = 0.009$). Mothers of twin babies were significantly less confident than mothers of singleton babies regarding being able to exclusively breastfeed their babies ($p < 0.001$ for all statements of confidence).

Conclusions: Twins usually start their first breastfeeding later than singleton babies, and also tend to achieve exclusive breastfeeding less than singleton babies. Exclusive breastfeeding is less practiced by mothers whose children are admitted to NICU and whose children did not start breastfeeding within the first 6 hours. Mothers of twin babies are less confident than those of singleton babies regarding being able to exclusively breastfeed their babies. Rooming-in of mothers with their babies should be allowed at NICU.

Key words: Exclusive breastfeeding, twins, Caesarian section, neonatal intensive care unit, Saudi Arabia

Introduction

Breastfeeding is the most important way to provide nutritional and health benefits for infants, especially during their first six months of life (1-3). Breast milk contains several immunologic factors, e.g., IgA. Moreover, breast feeding is associated with decreased risk of diabetes mellitus and obesity (4).

Compared with their non-exclusively breastfed counterparts, exclusively breastfed infants are less likely to be hospitalized. Frequency of hospital visits during infancy becomes less as the duration of breastfeeding increases (5). Furthermore, a breastfed child exhibits relatively higher cognitive functions (6).

Mothers who exclusively breastfeed their children greatly benefit in various ways. They experience delayed return of their ovulation and also have lower rates of ovarian and breast cancer (7). In addition, the strong bonds between mothers and their infants that becomes strengthened during breastfeeding cannot be overemphasized (8).

Due to the increasing use of infertility treatments, there is an observed growing incidence of multiple pregnancies worldwide (9). The rate for spontaneous occurrence of twins is about one in 250 pregnancies (10). In Riyadh, Saudi Arabia, Kurdi et al. (11) reported that the overall incidence of twins was 14/1000 births.

The WHO (12) recommended exclusive breastfeeding of infants for the first six months of life. Exclusive breastfeeding has been defined as feeding the baby with breast milk only without giving water, water-based foods or formula, except for medications, such as oral rehydration solution or syrups. However, this recommendation did not provide advice regarding what mothers with multiple births should do considering the challenges involved in caring for this group of infants.

Multiple pregnancies have been significantly linked with certain risks and complications, such as the higher likelihood of being born preterm, having a low birth weight and developing cerebral palsy, especially as birth weight falls (8). Östlund et al. (13) reported that almost 80% of mothers of twins could not breastfeed for more than for two months. Therefore, a large number of the preterm and term twins may not be exclusively breastfed and become weaned before 6 months.

Early cessation of breastfeeding in twins may occur for several reasons, e.g., delayed onset of lactation, persistent crying of babies after breastfeeding and ill health after Caesarean section (14-15). Yokoyama et al. (8) found that exclusive breastfeeding rate among twins was significantly lower than among singleton babies, i.e., 4.1% among twins compared with 44.7% among singletons.

In Saudi Arabia, there are no available data about breastfeeding rates among multiple babies. Moreover, there are very few studies on breastfeeding for twins. Therefore, it is important to explore factors that enhance or hinder exclusive breastfeeding among twins. This would

help develop strategies which could improve exclusive breastfeeding rates among twins as well as markedly reduce infant morbidity and mortality among this group of children.

Aim of study

To assess prevalence of exclusive breastfeeding practices and risk factors for failure to fulfill exclusive breastfeeding for twins delivered in Saudi Arabia.

Methodology

This research followed a comparative case-control study design in the Kingdom of Saudi Arabia. The study population comprised mothers delivering singleton or twin babies in Saudi Arabia during the last 12 months. The inclusion criteria were Saudi mothers who delivered their babies in Saudi Arabia within the last year, while mothers of triplets or quadruplets and non-Saudi mothers were not included.

The study included two groups; mothers who delivered twins during the last years (Study Group, n=178) and mothers who delivered singleton babies during the last year (Control Group, n=122).

Based on review of relevant literature, the researcher developed a self-administered questionnaire in simple Arabic language. The questionnaire included questions regarding personal characteristics of the mothers, breastfeeding practices of the baby, and questions about mothers' confidence toward their ability to exclusively breastfeed their babies.

A pilot study was conducted on 20 mothers (10 mothers of twins and 10 mothers of singleton babies) to test the wording and clarity of the included questions. The face and content validity of the study questionnaire was assessed by three family medicine consultants. Moreover, the internal consistency of the questionnaire was assessed by applying Cronbach's alpha reliability coefficient. Results of the pilot study helped in re-phrasing, adding or omitting some questions. The collected data within the pilot study were not included into the main study.

The final electronic version of the questionnaire was uploaded online and sent to groups of mothers with singleton and twin babies.

Collected data were analyzed using the Statistical Package for Social Sciences (SPSS version 25). Descriptive statistics (i.e., frequency, percentage, mean and standard deviation) were calculated. Appropriate tests of significance, e.g., chi-square (χ^2) test and independent variable t-test were applied accordingly. P-values less than 0.05 were considered statistically significant.

The researcher fulfilled all the required official approvals. On the first page of the study questionnaire, all potential participants were informed about the objectives and nature of this study. They were assured that no harm is expected to occur if they decide to participate. They were also assured about the anonymity and full confidentiality of their responses. Their online consent to participate was

made necessary for any participant to proceed in filling in the online questionnaire.

This study was self-funded by the researcher and there was no conflict of interest.

Results

Table (1) shows that the majority of mothers were aged 25-35 years (72.5% in the singleton group and 79.5% in the twins group). Mothers differed significantly according to their age groups, with less percentage of mothers of twins than those in the singleton group in the <25 years age group (5.7% and 15.2%, respectively, $p=0.039$). Caesarian delivery was significantly more among mothers of twins than mothers of singleton babies (79.5% and 35.4%, respectively, $p<0.001$). Admission to neonatal intensive care units was significantly more among twin babies than singleton babies (60.7% and 18.5%, respectively, $p<0.001$). Mothers in both study groups did not differ significantly according to their employment status, residence, and family monthly income.

Table (2) shows that significantly less twins than singleton babies started breastfeeding during the first 6 hours after birth (48.4% and 73%, respectively, $p<0.001$). There were significantly less twin than singleton babies who were exclusively breastfed (46.7% and 79.2%, respectively, $p<0.001$, Figure 1).

Table (3) shows that exclusive breastfeeding was significantly more practiced by mothers whose children were not admitted to neonatal intensive care units (NICU) than those whose children were admitted to NICU (64.6% and 35.1%, respectively, $p=0.001$). Exclusive breastfeeding was also significantly more practiced by mothers whose children started breastfeeding within the first 6 hours than those who started breastfeeding after 6 hours ($p=0.009$). There were no significant differences in exclusive breast feeding practices according to mothers' age groups, educational level, employment status, residence, family monthly income, or mode of delivery.

Table (4) shows that mothers of twin babies were significantly less confident than mothers of singleton babies regarding being able to exclusively breastfeed their babies ($p<0.001$ for all statements of confidence).

Table 1: Personal characteristics of participant mothers

Mothers' personal characteristics	Singleton (n=178)		Twins (n=122)		P Value
	No.	%	No.	%	
Age Groups					
• <25 years	27	15.2	7	5.7	0.039
• 25-35 years	129	72.5	97	79.5	
• >35 years	22	12.4	18	14.8	
Educational level					
• Intermediate	3	1.7	5	4.1	0.418
• Secondary	24	13.5	18	14.8	
• University	151	84.8	99	81.1	
Employment					
• Employed	66	37.1	33	27.0	0.070
• Housewife	112	62.9	89	73.0	
Residence					
• Rural	15	8.4	10	8.2	0.943
• Urban	163	91.6	112	91.8	
Family monthly income					
• <5,000 SR	44	24.7	34	27.9	0.820
• 5,000-10,000	58	32.6	39	32.0	
• >10,000	76	42.7	49	40.2	
Mode of delivery					
• Vaginal	115	64.6	25	20.5	<0.001
• Caesarian	63	35.4	97	79.5	
Admission to neonatal intensive care unit	33	18.5	74	60.7	<0.001

Table 2: Duration between delivery and baby's first breastfeeding

Variables	Singleton		Twins		P Value
	No.	%	No.	%	
Duration till first breastfeeding					
• < One Hour	73	41.5	27	22.1	
• 1-6 Hours	55	31.3	32	26.2	
• 7-24 Hours	31	17.4	44	36.1	
• > 24 Hours	17	9.6	19	15.6	<0.001
Exclusive breastfeeding					
• Yes	141	79.2	57	46.7	
• No	35	20.8	65	53.3	<0.001

Figure 1: Prevalence of practicing exclusive breastfeeding (%) according to product of participant mothers' last pregnancy

Table 3: Exclusive breastfeeding practices among mothers of twins according to their personal characteristics

Mothers' personal characteristics	Exclusive breastfeeding for six months				P Value
	No (n=65)		Yes (n=57)		
	No.	%	No.	%	
Age Groups					0.434
• <25 years	5	71.4	2	28.6	
• 25-35 years	49	50.5	48	49.5	
• >35 years	11	61.1	7	38.9	
Educational level					0.368
• Intermediate	4	80.0	1	20.0	
• Secondary	8	44.4	10	55.6	
• University	53	53.5	46	46.5	
Employment					0.518
• Employed	16	48.5	17	51.5	
• Housewife	49	55.1	40	44.9	
Residence					0.269
• Rural	7	70.0	3	30.0	
• Urban	58	51.8	54	48.2	
Family monthly income					0.554
• <5,000 SR	19	55.9	15	44.1	
• 5,000-10,000	18	46.2	21	53.8	
• >10,000	28	57.1	21	42.9	
Mode of delivery					0.886
• Vaginal	13	52.0	12	48.0	
• Caesarian	52	53.6	45	46.4	
Admission to neonatal intensive care unit					0.001
• No	17	35.4	31	64.6	
• Yes	48	64.9	26	35.1	
Duration till first breastfeeding					0.009
• < One Hour	12	44.4	15	55.6	
• 1-6 Hours	11	34.4	21	65.6	
• 7-24 Hours	27	61.4	17	38.6	
• > 24 Hours	15	78.9	6	21.1	

Table 4: Comparison between mothers of singleton babies and those of twins about their confidence toward exclusive breast feeding of their babies

Statements of mothers' confidence	Group	Agree		Neutral		Disagree		P value
		No.	%	No.	%	No.	%	
I can decide if my baby gets enough breastfeeding	Singleton	123	69.1	44	24.7	11	6.2	<0.001
	Twin	64	52.5	31	25.4	27	22.1	
I can fulfill absolute breastfeeding for my baby	Singleton	112	62.9	37	20.8	29	16.3	<0.001
	Twin	40	32.8	35	28.7	47	38.5	
I can fulfill absolute breastfeeding without supplements	Singleton	83	46.6	49	27.5	46	25.8	<0.001
	Twin	25	20.5	36	29.5	61	50.0	
My baby stays connected to my breast during feeding	Singleton	121	68.0	36	20.2	21	11.8	<0.001
	Twin	48	39.3	36	29.5	38	31.1	
I can satisfactorily control absolute breastfeeding	Singleton	95	53.4	44	24.7	39	21.9	<0.001
	Twin	33	27.0	37	30.3	52	42.6	
I can continue breastfeeding my baby even while crying	Singleton	101	56.7	49	27.5	28	15.7	<0.001
	Twin	24	19.7	36	29.5	62	50.8	
I can continue breastfeeding my baby till he is 6 months old	Singleton	141	79.2	18	10.1	19	10.7	<0.001
	Twin	51	41.8	31	25.4	40	32.8	
I breastfeed my child even when relatives are around	Singleton	117	65.7	35	19.7	26	14.6	<0.001
	Twin	39	32.0	32	26.2	51	41.8	
I feel satisfied when breastfeeding my baby	Singleton	151	84.8	17	9.6	10	5.6	<0.001
	Twin	69	56.6	30	24.6	23	18.9	
I can manage the long period of absolute breastfeeding	Singleton	124	69.7	37	20.8	17	9.6	<0.001
	Twin	46	37.7	35	28.7	41	33.6	
I can finish feeding my baby from one side before starting the other	Singleton	98	55.1	55	30.9	25	14.0	<0.001
	Twin	39	32.0	44	36.1	39	32.0	
I can provide absolute breastfeeding to all my babies	Singleton	106	59.6	46	25.8	26	14.6	<0.001
	Twin	29	23.8	45	36.9	48	39.3	
I can fulfill all my baby's needs regarding breastfeeding	Singleton	107	35.7	42	14.0	29	9.7	<0.001
	Twin	31	25.4	40	32.8	51	41.8	
I can decide when my baby feels full when breastfed	Singleton	109	61.2	45	25.3	24	13.5	<0.001
	Twin	42	34.4	37	30.3	43	35.2	

Discussion

Breastfeeding is the most useful source of nutrients during the initial six months of life. It is even more significant in multiple pregnancies, since pre-term and low birth weight babies are more common (16).

This study aimed to assess prevalence of exclusive breastfeeding practices and risk factors for failure to fulfill exclusive breastfeeding for twins delivered in Saudi Arabia.

The present study revealed that mothers with twin deliveries were significantly older than those of singleton deliveries. Moreover, Caesarian deliveries and admission to neonatal intensive care units (NICU) were significantly more among mothers of twins than mothers of singleton babies.

These findings are in accordance with those of Khazardoost and Shafaat (17), who reported that women with multiple pregnancies were older, delivered earlier, and underwent more Caesarean deliveries. Similarly, Su et al. (18) added that multiple pregnancy was significantly associated with older maternal age, Caesarean delivery, preterm labor, low birth weight and NICU admissions. In addition, Cinar et al. (16) reported that 90% of the mothers of twins were delivered by Caesarean section.

Results of this study showed that significantly less twins than singleton babies started breastfeeding within the first six hours after birth (48.3% and 72.8%, respectively). Moreover, there were significantly less exclusively breastfed twins than singleton babies (46.7% and 79.2%, respectively).

These findings are in accordance with those of several studies, which indicated that twins are less likely to be exclusively breastfed, compared to their singleton counterparts (8; 16; 19-20).

In the UK, Simmons et al. (21) reported that the rate of breastfeeding of twins was significantly less than that of single babies (40% and 52%, respectively). In Japan, Yokoyama et al. (8) concluded that exclusive breastfeeding among twins was 4.9%, while that of the singletons was 73.2%. In Ghana, Odei (22) reported 44% exclusive breastfeeding rate for six months among singleton infants compared to only 14% of twins.

The low exclusive breastfeeding rates among twins can be explained by the repeated link of prematurity with multiple pregnancies, lack or weakness of sucking reflex, neurodevelopmental failure, and separated due to stay in the intensive care (23).

The present study showed that exclusive breastfeeding was significantly less practiced by mothers whose children were admitted to the NICU and also by mothers whose children did not start breastfeeding within the first 6 hours after birth. However, exclusive breastfeeding did not differ significantly according to mothers' age, educational level, employment status, residence, monthly income, or mode of delivery.

Beal and Hearman (24) stated that admission into the NICU leads to delayed maternal attachment. Moreover, parents with an infant in the NICU may experience depression, anxiety, stress, and loss of control, and they hesitate between feelings of inclusion and exclusion related to the provision of healthcare to their baby (25). Moreover, mothers tend to look for alternatives to feed their children. This could explain why most mothers who had either one or both of their children admitted into the NICU do not practice exclusive breastfeeding (20). This observation is in accordance with findings of Weimers et al. (26), who reported that 70% of mothers did not practice exclusive breastfeeding as a result of neonatal intensive unit admission.

Several studies found that some socio-demographic and economic factors, such as maternal age, education, employment and household income are important determinants of exclusive breastfeeding (27-28).

The World Health Organization (29) recommended that newborns should only be fed mother's milk directly from the breast, and breastfeeding should be initiated within an hour after birth to promote successful breastfeeding. Kim (30) emphasized that each hour delay in the first breastfeeding session is associated with a reduced likelihood of breastfeeding throughout the hospital stay. Rooming-in was associated with an increased likelihood of breastfeeding throughout the hospital stay. Therefore, to encourage breastfeeding of babies at neonatal intensive care units, mothers should have a bed after being discharged from the maternity ward to allow for rooming-in.

Results of this study revealed that mothers of twin babies were significantly less confident than those of singleton babies regarding being able to exclusively breastfeed their babies.

Chatman et al. (31) reported that the dominant reason for partial exclusive breastfeeding was maternal lack of confidence that breast milk alone might not provide sufficient nourishment for their babies. The perception of breast milk insufficiency has been reported by other researchers to be a major barrier to exclusive breast feeding (14). The majority of mothers who are not confident of producing adequate breast milk to satisfy their infants usually introduce other foods and liquids, particularly formula and porridge before six months (20).

It is to be noted that breast milk production is based on a supply-and-demand relationship. Even for multiple babies, it is usually sufficient for each baby (32-34). Prosser et al. (35) found that mothers who were breastfeeding twin babies had twice as much prolactin secretion compared to those with single babies. Therefore, twins can be adequately fed with breast milk, but special efforts are needed to promote and encourage breastfeeding among mothers of twins (16).

Ukegbu et al. (36) stated that perception of breast milk insufficiency has been reported to be a major barrier against exclusive breastfeeding among twins and singletons.

High milk production among mothers was associated with perceived confidence of mothers in breastfeeding (37). Perceived confidence of mothers to produce enough milk for their twin babies is positively associated with exclusive breastfeeding. This finding underscores the importance of mother's emotional and psychological stability in ensuring adequate milk production, which is crucial in ensuring successful exclusive breastfeeding of infants in the first six months of life (20).

Therefore, to promote exclusive breast feeding, especially for twins, all mothers should be supported to have confidence in themselves, get enough rest, ensure they are well-fed, get support from people close to them, and try to ensure that their baby's suction power is sufficient.

In conclusion, twins usually start their first breastfeeding later than singleton babies, and also tend to achieve exclusive breastfeeding less than singleton babies. Exclusive breastfeeding is less practiced by mothers whose children are admitted to NICU and whose children did not start breastfeeding within the first 6 hours. Mothers of twin babies are less confident than those of singleton babies regarding being able to exclusively breastfeed their babies.

Therefore, it is recommended that breastfeeding should be initiated within an hour after birth. Rooming-in of mothers with their babies should be allowed at NICU. All mothers should be supported to have confidence in themselves regarding being able to exclusively breastfeed their babies.

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Monogenic diabetes: importance of genetic testing

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Abstract

There are various forms of monogenic diabetes and these include neonatal diabetes mellitus, maturity-onset diabetes of the young (MODY), mitochondrial diabetes, and rare diabetes-associated syndromic diseases. Single gene forms of diabetes represent an uncommon heterogeneous group of conditions mainly characterized by functional defects of pancreatic beta cells with consequential moderate to severe hyperglycemia.

The body of the article will focus mainly on MODY. The classic presentation of MODY includes non-ketotic noninsulin-dependent diabetes with diagnosis before the age of 25 and with an affected parent. According to various studies, there is a substantial number of individuals with a confirmed genetic diagnosis of MODY that does not fit the classic clinical description and approximately > 80% of MODY cases are not diagnosed by molecular testing. Mutations in GCK, HNF1A, and HNF4A are the most common causes of MODY.

Differences in screening recommendations for diabetes varies across countries, but the reported prevalence of these causes in young people collectively accounts for almost 85–90% of all MODY cases. Incidence has increased in recent years due to greater understanding and wider accessibility of genetic testing. Unfortunately, there are no statistics on the incidence of monogenic diabetes in Saudi Arabia or other Middle Eastern countries, compared to their Western counterparts.

Diagnosis includes the use of a probability calculator and then genetic testing. There is much debate on availability and cost effectiveness of genetic testing. Accurate genetic diagnosis impacts treatment in the most common types of monogenic diabetes, including the use of sulfonylureas in place of insulin or other glucose-lowering agents, or discontinuing pharmacologic treatment altogether. However, it allows for precision medicine which in turn saves money, gives better quality of life to patients and postpones onset of diabetic complications.

There are plenty of advantages to genetic testing considering the increasing incidence of diabetes in young people and how the wrong type of treatment can cause physical and psychological impact.

Key words: monogenic diabetes, maturity onset diabetes of the young (MODY), mitochondrial diabetes, diabetes-associated syndromic diseases

Introduction

Monogenic diabetes was first defined in mainstream literature by Tattersall and Fajans in 1975. They described it as a series of non-insulin dependent diabetes with autosomal dominant inheritance in young adults, as MODY. Further criteria mentioned was it occurs in early age, commonly less than 25 years, insulin independence for at least 5 years from diagnosis and absence of ketosis at any time were the clinical diagnostic criteria for MODY.

MODY is the most common type of monogenic diabetes and involves beta-cell dysfunction. There are some extra-pancreatic features that help as indicators of specific subtypes of MODY: presence of macrosomia and neonatal hypoglycemia in subtype HNF4A–MODY and renal cysts in subtype HNF1B–MODY. Other subtypes are categorized by stable levels of blood glucose throughout the patient's lifetime, others by a progressive waning of insulin secretion and poor glucose control. Additionally, patients with some subtypes are prone to develop micro- and macrovascular complications whereas those with other subtypes do not and it is this characteristic which drives the decision to treat or not, early in childhood. Intriguingly, the observable glycemic traits can vary among carriers of the same mutations and even within the same family generation.

Greater than 80% of patients with MODY are incorrectly diagnosed with type 1 and type 2 diabetes at presentation, with patients experiencing a delay of 12 years from the time of receiving a diabetes diagnosis to receiving a MODY diagnosis in a UK report. To prevent onset and progression of microvascular complications we need to achieve target glycemic control hence the need to detect at early age.

Maturity Onset Diabetes of the Young (MODY)

MODY is an uncommon form of diabetes with specific features that distinguish it from type 1 and type 2 diabetes and is caused by a defect in a single gene, is clinically heterogenous and characterized by impaired insulin secretion. MODY affects 1–6% of patients with diabetes. Primarily autosomal dominant, but a de novo mutation should be considered in those patients without a family history of diabetes but with clinical and biochemical findings highly indicative of MODY. There are 14 known subtypes of MODY, and mutations in three genes (HNF1A, HNF4A, GCK) which account for about 95% of all MODY cases with a detection rate that varies among different study populations.

At present, three main criteria define the disease: mild hyperglycemia or overt diabetes in at least three consecutive generations; onset usually before the age of 25 years; absence of islet autoantibodies and lack of characteristics of type 2 diabetes (i.e., insulin resistance, obesity).

Mutations in the genes causes β -cell dysfunction, which leads to the development of types of MODY described in Figure 3.

Focus must be placed on correct diagnosis to ensure a strengthened link to important treatment benefits, such as a more accurate prognosis of the risk of complications, avoidance of stigma and limitations to the patients, and appropriate genetic counseling for family members, especially children, but most importantly it directs the choice of the best treatment. The personalizing of medical treatment to the characteristics of each patient has been termed "Precision Medicine". Precision medicine refers to the use of combined knowledge of a person to predict susceptibility to a specific disease identifying etiologic mechanisms, prognosis of the disease and response to a specific treatment. Benefits in being able to determine with some degree of accuracy the most appropriate treatment includes cost-saving and the avoidance of ineffective therapy with its possible side effects. Specifically, for diabetic patients, precision medicine refers to determining the most appropriate method for self-monitoring blood glucose and avoiding the burden of insulin injections when unnecessary.

Misdiagnosis of type 1 and 2 diabetes can be avoided if clinicians are able to establish a correct molecular diagnosis and with progress now in genetic testing, assisted by the development of new techniques (i.e., Next Generation Sequencing) and increased accessibility to genetic testing facilities they can achieve this more accurately. MODY can be diagnosed by direct sequencing with up to 100% sensitivity. Testing is increasing throughout the world and most developed countries have at least one academic, health service or commercial laboratory providing testing. There are of course regions with limited resources but there needs to be a target population for necessary molecular genetic testing to improve detection rates. There are various algorithms that aid molecular diagnosis by using clinical and laboratory parameters to highlight individual candidates. Interestingly, one developed model revealed that a useful discriminator between MODY and T2DM is age of diagnosis below 30 years. Also, a family history of diabetes increased the probability of MODY diagnosis by 23 times in those who had been initially categorized as T1DM.

The University of Exeter has created a calculator to assess the probability of MODY and it is currently available online. The Exeter laboratory have gone from approximately 50 patients being diagnosed with MODY in 1996 to approximately 5,000 diagnoses in 2016. It can be a helpful tool to learn more about the factors that can influence a suspicion of monogenic diabetes. The tool calculates a Positive Predictive Value (PPV) which varies substantially based on the BMI of the patient, current insulin treatment, and if the patient has an affected parent. The only criticism is that this tool was created based on a primarily Caucasian European population hence it may not be as useful for patients from ethnic minorities who may have shifted BMI curves or for the possibility of a de novo mutation.

A urine C-peptide creatinine ratio (UCPCR) test can be useful in distinguishing type 1 diabetes from a monogenic form of diabetes but does not distinguish from type 2 diabetes. However, at this time it is used mainly for research purposes and this method is less invasive than blood c-peptide testing.

Figure 1: Characteristic phenotypes of the commonly encountered diabetes subtypes, illustrating the clinically useful differences between type 1 and type 2 diabetes, and monogenic forms of diabetes.

Features associated with diabetes	Monogenic diabetes				
	GCK* [‡]	HNFA [#]	HNFA4 [#]	HNFB [#]	MIDD [‡]
Type 1 diabetes	Young onset Type 2 diabetes				
DKA	No	No [∞]	No [∞]	No	Yes/No
Parent affected	Yes ⁼	Yes	Yes	Yes	Mother
Age of onset	Adolescence and young adulthood	Teens to young adulthood	Teens to young adulthood	Teens to young adulthood	Young adulthood
Obesity	Population frequency	Population frequency	Population frequency	Population frequency	Rare
Glycaemic pattern	Stable, mild fasting glycaemia	Post-prandial hyperglycaemia initially, progressing to general hyperglycaemia	Post-prandial hyperglycaemia initially, progressing to general hyperglycaemia	Post-prandial hyperglycaemia initially, progressing to general hyperglycaemia	Variable dysglycaemic pattern either acute or slowly progressive
β cell antibodies [‡]	No	No	No	No	No
C-peptide [‡]	Normal	Low but Detectable	Low but Detectable	Low but Detectable	Low but detectable
hsCRP	Normal	Very low	Normal	Normal	Normal
Additional clinical features	Absence of microvascular and macrovascular complications	Low renal threshold for glucose in early stages of diabetes	Macrosomia and transient neonatal hypoglycaemia	High renal involvement e.g., cysts etc.	Deafness, short stature, macular dystrophy

* = Glucokinase; # = Hepatocyte nuclear factor; β = Mitochondrial diabetes and deafness; ∞ = Excellent responses to Sulphonylurea therapy are commonly noted; = = whilst the autosomal dominant inheritance pattern requires that at least one parent must be a carrier of the mutated gene, GCK mutations are frequently subclinical and an absence of a known family history of diabetes is not uncommon; ± = β cell antibodies are detected in approximately 90% of patients with type 1 diabetes at onset of dysglycaemia although the sensitivity declines later in the disease. Absent autoantibodies >5 years following onset are commonly seen in confirmed type 1 diabetes. Conversely, a small number of patients with type 2 diabetes and monogenic diabetes will have one or more detectable β cell antibodies; ‡ = PCOS = Polycystic ovary syndrome.

Figure 2: Diagnostic algorithm for assessment of suspected monogenic diabetes diagnosed at <35 years old

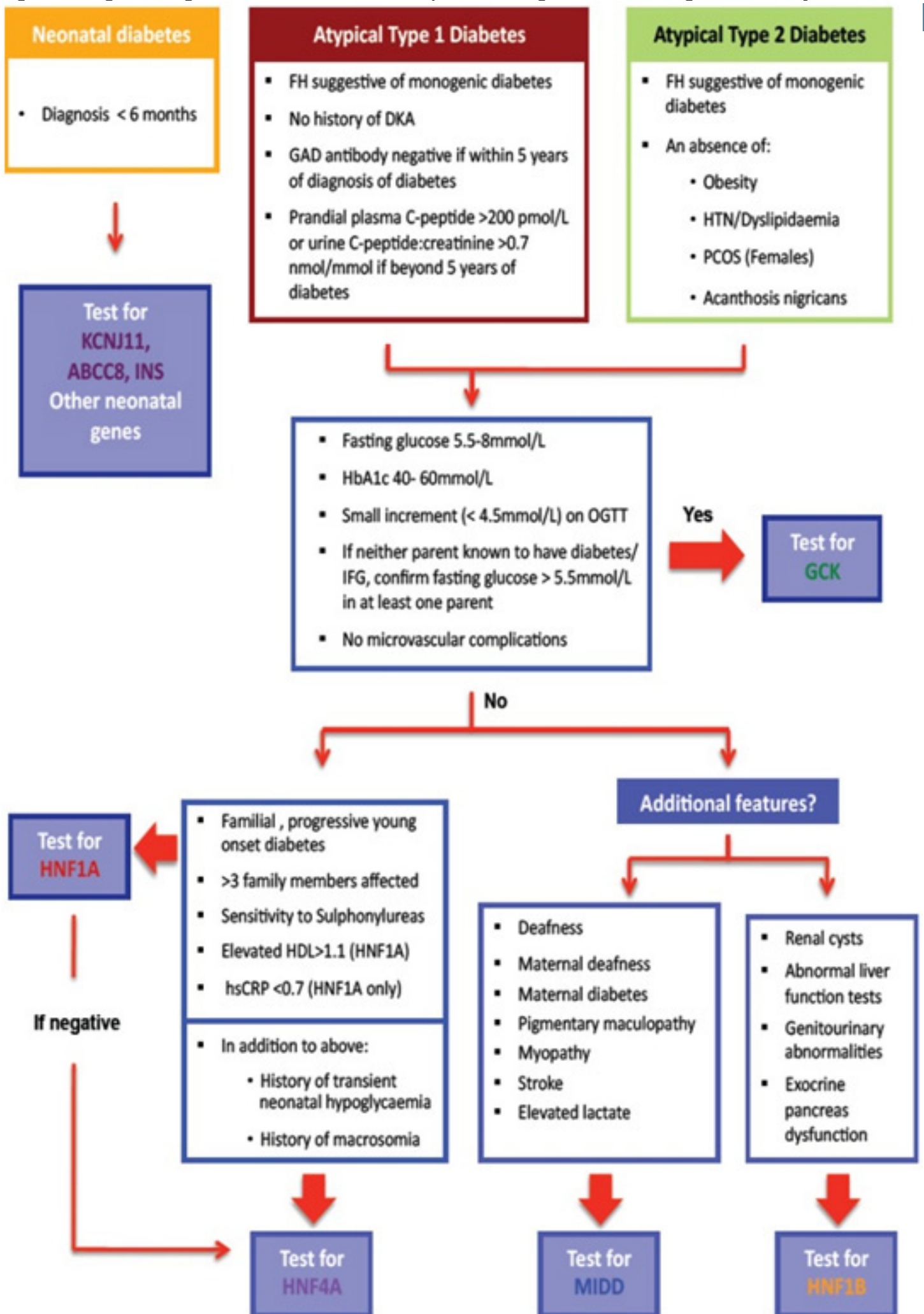


Figure 3: Classical characteristics of MODY genetic subtypes.

MODY type	Gene name (locus)	Protein function	Prevalence	Other features	Treatment	OMIM*
MODY 1	<i>HNF4A</i> (20q12)	Transcription factor	5–10%	Neonatal hyperinsulinemia and hypoglycemia with associated macrosomia, low serum levels of cholesterol	Sensitive to sulfonylureas	125850, 600281
MODY 2	<i>GCK</i> (7p13)	Glycolytic enzyme	30–60%	Mild fasting hyperglycemia throughout life, often asymptomatic, gestational diabetes, low birth weight (with unaffected mother)	No treatment outside of pregnancy	138079, 125851
MODY 3	<i>HNF1A</i> (12q24.2)	Transcription factor	30–60%	Glycosuria	Sensitive to sulfonylureas	600496, 142410
MODY 4	<i>PDX1</i> (13q12.1)	Transcription factor	<1%	Homozygote: pancreatic agenesis	Diet, OAD, or insulin	600392, 600733
MODY 5	<i>HNF1B</i> (17q21)	Transcription factor	5–10%	Diabetes in association with renal and genito-urinary abnormalities	Insulin	137920, 189907
MODY 6	<i>NEUROD1</i> (2q31.3)	Transcription factor	<1%	Obesity and insulin resistance	OAD or insulin	606394, 601724
MODY 7	<i>KLF11</i> (2p25)	Transcription factor	<1%	Impaired glucose tolerance to overt diabetes	OAD or insulin	603301, 610508
MODY 8	<i>CEL</i> (9p34)	Lipase enzyme	<1%	Diabetes and pancreatic exocrine. Endocrine deficiency	OAD or insulin	114840, 609812
MODY 9	<i>PAX4</i> (7q32)	Transcription factor	<1%	Ketosis prone diabetes	Diet, OAD, or insulin	167413, 612225
MODY 10	<i>INS</i> (11p15.5)	Hormone	<1%	May result in neonatal diabetes, antibody-negative diabetes, and MODY	OAD or insulin	613370, 176730
MODY 11	<i>BLK</i> (8p23)	Tyrosine kinase	<1%	Obesity common	Diet, OAD, or insulin	191305, 613375
MODY 12	<i>ABCC8</i> (11p15.1)	SUR1 (KATP channel regulatory subunit)	<1%	Usually associated with neonatal diabetes, rare cause of MODY	Sensitive to sulfonylureas	600509
MODY 13	<i>KCNJ11</i> (11p15.13)	Kir6.2 (KATP channel regulatory subunit)	<1%	Usually associated with neonatal diabetes, rare cause of MODY	Sensitive to sulfonylureas	616329, 600937
MODY 14	<i>APPL1</i> (3p14.3)	Serine/threonine kinase	<1%	Adult-onset diabetes	Diet, OAD, or insulin	616511, 604299

ABCC8 ATP-binding cassette, subfamily C (CFTR/MRP), member 8, *APPL1* adaptor protein, phosphotyrosine interacting with PH domain and leucine zipper 1, *BLK* B lymphocyte kinase, *CEL* carboxyl ester lipase enzyme, *GCK* glucokinase, *HNF1A* hepatocyte nuclear factor-1a, *HNF1B* hepatocyte nuclear factor-1b, *FLNFA4* hepatocyte nuclear factor-4a, *INS* preproinsulin, *KATP* ATP-sensitive potassium channel, *KCNJ11* potassium channel, inwardly rectifying subfamily J, member 11, *KLF11* Kruppel-like factor 11, *NEUROD1* neurogenic differentiation factor 1, *OAD* oral anti-diabetic, *PAX4* paired box gene 4, *PDX1* pancreas/duodenum homeobox protein 1, *SUR1* sulfonylurea receptor 1

*The Online Mendelian Inheritance in Man (OMIM; <http://omim.org>) numbers indicate the descriptive entry of the phenotype and/or gene

Figure 4. Molecular genetics-based approach for precision diabetes in monogenic and type 2 diabetes

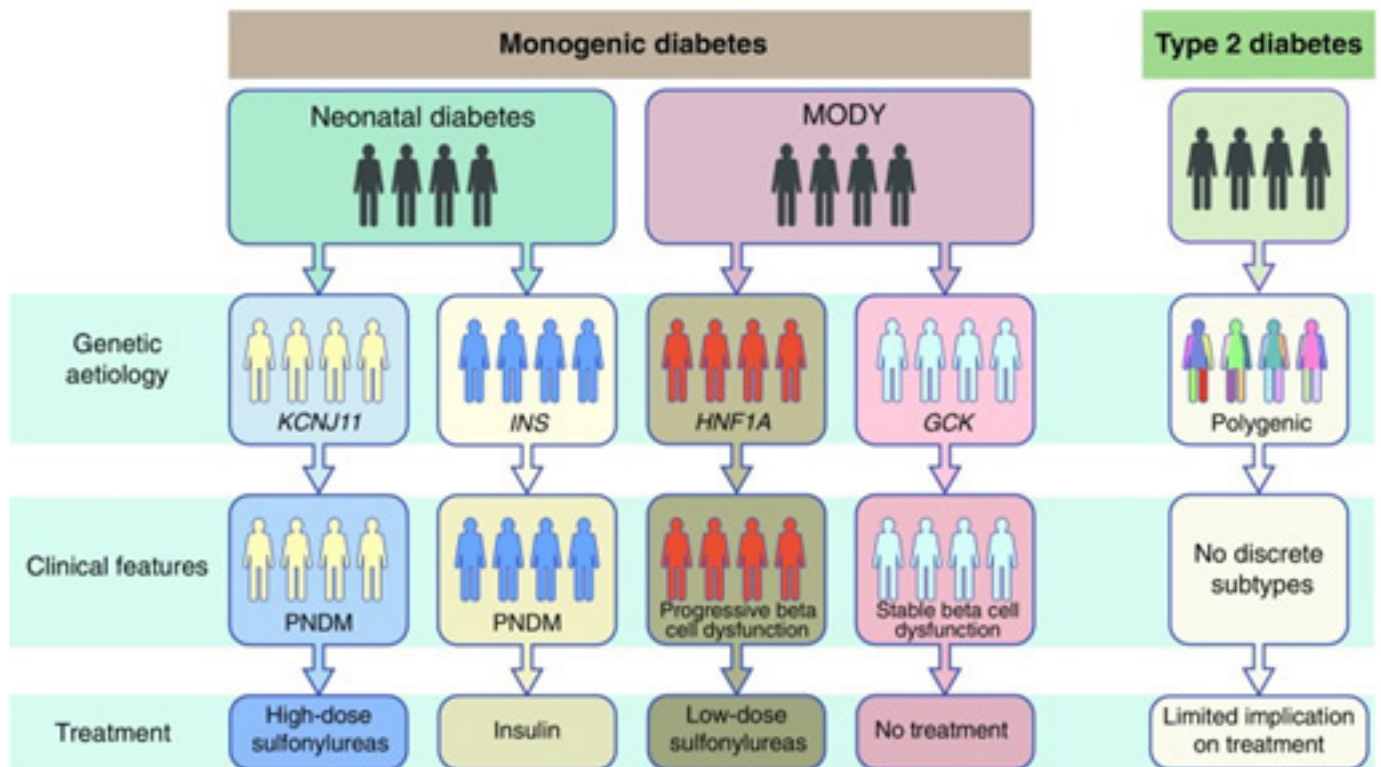
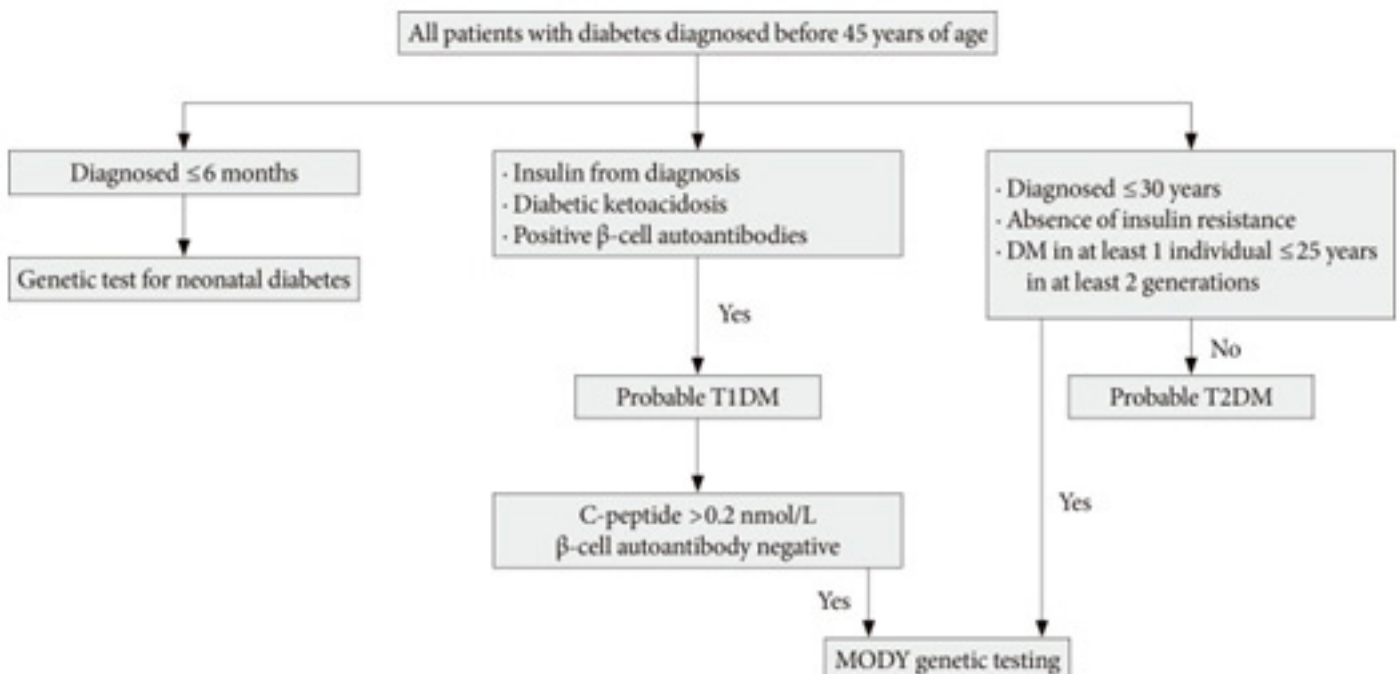


Figure 5. Diagnostic algorithm for MODY, T1DM AND T2DM



Genetic testing can be not only expensive, available in only specialized laboratories but also time consuming. Focus needs to be on Diabetologists to increase their expertise in this area, and suspected cases should be referred to a specialist in monogenic diabetes or a clinical geneticist working in this field to maximize the diagnostic yields. Results from recent simulation modeling suggest that testing for MODY genes is cost-effective in targeted individuals.

Results from the UK suggest that within the context of the National Health Service (NHS), the additional costs of genetically testing (a relatively large number of) individuals are likely to be offset by the lifetime savings from the subsequent treatment changes in a very small proportion of individuals. However, lifetime cost savings are approximately only £100–£200 (UK). If we assume around 200,000 individuals in England and Wales who are <50 years old and have had a diagnosis of diabetes before the age of 30 years have applied beneficial strategies, between £20 million and £40 million savings are possible. To be able to apply these findings to other populations the cost of the testing especially will need to be updated. If the genetic test costs are significantly higher than predicted, then it is unclear whether the Clinical Prediction Model Testing and Biomarker Testing strategies could be

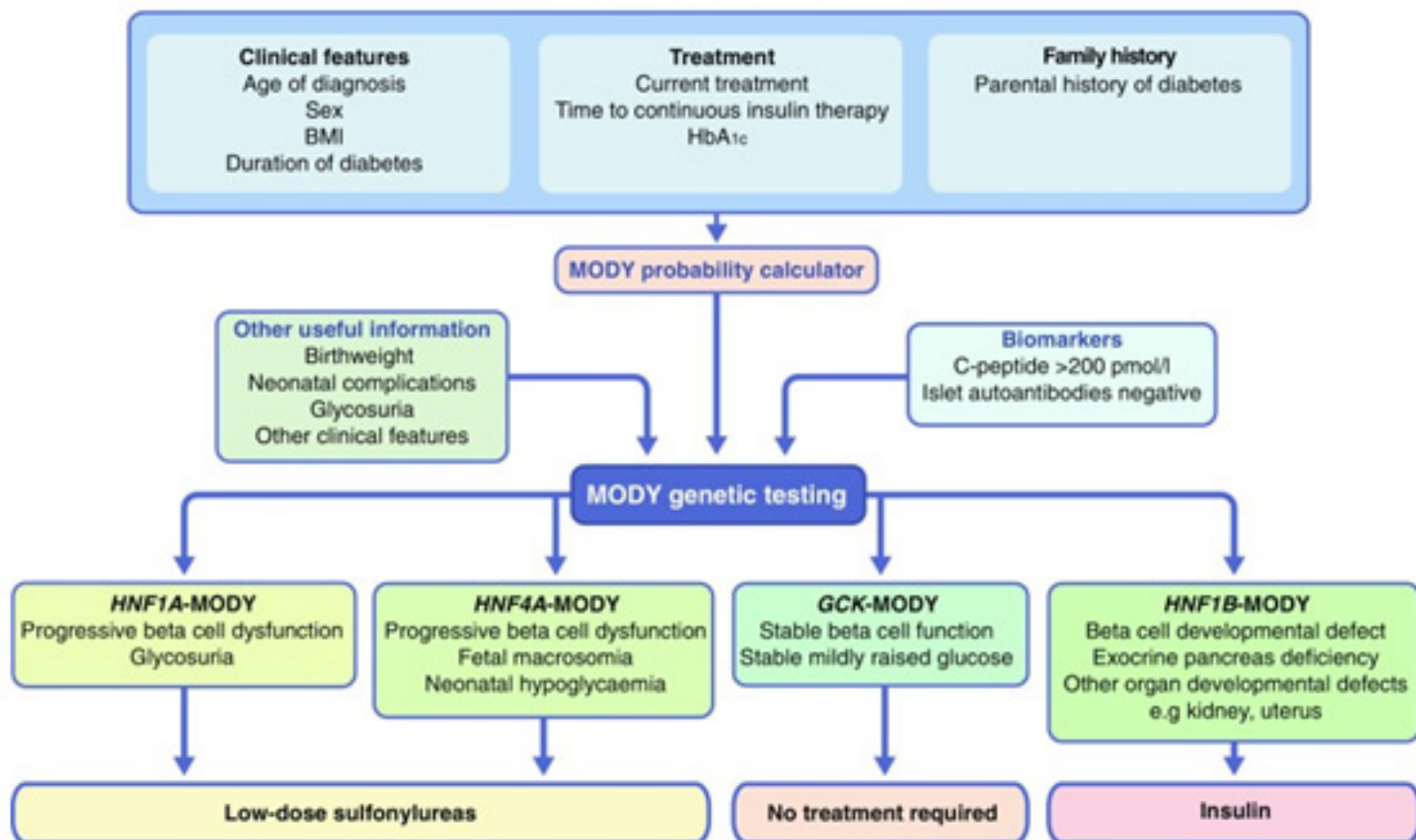
considered cost saving, or even cost neutral. However, further collection of treatment patterns, home blood glucose monitoring frequency, HbA1c and quality of life data are needed to aid model development including the incident cohort. Once feasibility has improved to detect those with monogenic diabetes only then can evaluation for effectiveness and cost effectiveness be done.

Treatment options

Personalized medicine approach can be implemented with earlier detection of monogenic diabetes in children and adolescents. In young people there is an accumulation of long duration of hyperglycemia and suboptimal control. Also, the aggressive nature of certain mutations makes it more prone for them to develop disease complications.

Target treatment to a single genetic mutation has shown to result in improvements in glycemic control, fewer diabetic complications, and decreased cost as well as burden of treatment. Regarding surveillance of complications and associated extra-pancreatic disorders and identification of affected and at-risk family members it is imperative to differentiate between monogenic diabetes and type 1 or type 2 diabetes.

Figure 6. Identification, important clinical features and treatment implications for common subtypes of MODY



Precision diabetes in MODY patients has an important clinical feature which is the differential treatment response in discrete genetic groups.

- GCK-MODY patients do not require any treatment and there is no response to treatment.
- HNF1A- and HNF4A-MODY patients can be treated with low-dose sulfonylureas. Additional treatment if required: dipeptidyl peptidase-4 (DPP-4) inhibitors, glucagon-like peptide-1 (GLP-1) receptor agonist and insulin in addition to sulfonylureas.
- HNF1B-MODY requires insulin treatment as response to oral hypoglycemics is limited.

There can be large implications on the differences in treatment response in MODY. The best example is in HNF1A-MODY where there is enhanced sensitivity to sulfonylureas, the consequence being severe hypoglycemic with even standard doses and that discontinuing sulfonylureas results in a marked deterioration in blood glucose (a 5%-point reduction [31 mmol/mol] in HbA1c). A randomized trial displayed that sulfonylureas led to a four-fold greater reduction of fasting blood glucose in HNF1A-MODY patients compared with age, BMI and blood glucose level-matched type 2 diabetes patients. The sensitivity recognition of sulphonylureas was not a prediction from gene function but actual clinical observation.

In patients with GCK-MODY strikingly, there is a lack of glycemic response with oral hypoglycemic agents or low-dose insulin. There is a lack of efficacy with insulin administration at its median dose with no difference in birthweight of babies born to mothers who used or did not use insulin in GCK-MODY. There are some situations where a pregnant GCK-MODY woman will need insulin, but even at very high doses, its ability to lower the mother's blood glucose levels is partial. Interestingly, as a result of insulin and counter-regulatory hormones GCK-MODY patients have a regulated blood glucose set to a higher level so the lack of response to therapy may be predicted due to this.

GCK-MODY:

- Stable, mild fasting hyperglycemia.
- Treatment not recommended as no significant change in glycemic level.
- A study of 117 probands with GCK mutations found that nearly 50% of subjects were inappropriately given oral hypoglycemics prior to genetic testing, with hypoglycemia as the most commonly reported side-effect. Following genetic diagnosis, nearly 80% of subjects stopped medications with no change in HbA1c levels at follow-up.
 - No increase in diabetes-related complications.
 - Identifying early is important to avoid unnecessary pharmacological risks and costs.

HNF1A- and HNF4A-MODY:

- Most display a pronounced sensitivity to sulfonylureas (sometimes with hypoglycemia).
- Can maintain target glycemic control on very small oral doses.
- Patients on insulin therapy before obtaining a correct genetic diagnosis often have poorer glycemic control.
- Additional therapies such as GLP-1 receptor agonists, may help in lowering glucose levels without significant risk of hypoglycemia.
- Glinide therapy has a shorter duration of action compared to sulphonylureas hence reduced risk for hypoglycemia therefore beneficial for active adolescents.

HNF1B-MODY:

- Oral hypoglycemics work in over 50% of patients from diagnosis, the others do need insulin.
- Insulin also appears to be needed after 5-6 years of oral therapy.
- Changing from insulin to oral hypoglycemics has a low success rate.

Psychology:

Changing medication regimes from insulin to tablets can have a positive impact on people's lives but they do need support on this adjustment as it can take months. It is a major decision for some who have accepted for a long time they will use insulin for life. Feelings experienced can be a combination of excitement and anxiety; when reflecting on their journey on insulin they can feel annoyed, especially when the need for insulin treatment had been questioned at diagnosis. Patient responses are influenced by previously received messages from healthcare professionals on the importance of insulin treatment and the length of time on insulin; it can be difficult for some to 'let go'. Some patients are likely to need insulin again at some stage in the future due to the progressive nature of certain genetic mutations and they will be followed up. In contrast, others can feel an improvement in their lifestyle and self-image with feelings of relief and normality again.

Conclusion

Identification of monogenic forms of diabetes among children and adolescents remains a challenge, and as a result, these conditions are largely underdiagnosed with missed opportunities for genetically targeted management. Even though monogenic forms of diabetes are uncommon overall, the clinical implications of the diagnosis for the individual and their family support the use of genetic testing in appropriate cases.

Factors contributing to misdiagnosis include:

- clinical and genetic heterogeneity of the different subtypes
- clinical overlap with the more common polygenic forms of diabetes
- high cost of genetic testing
- limited knowledge of the condition by health care professionals

However, the probability calculator that combines biomarkers with phenotype is a promising approach to target individuals that need testing. In particular, the absence of the classic features of type 1 or type 2 diabetes, early onset, family history, and presence of extra pancreatic features should warrant consideration of an underlying genetic form of diabetes.

Further information is needed to reduce uncertainties in the modeling such as data collection on longer-term treatment plans and frequency of HBGM data. Future work to evaluate the use of genetic testing strategies soon after diagnosis of diabetes can support policy makers also.

Raising awareness of monogenic diabetes and making the diagnosis more accessible will improve disease prognosis and disease management in children and their families. Not only are there cost saving benefits but also the impact this has on the patient from a physical and emotional perspective.

Current data does not address ethnic diverse populations but more so Caucasians. Increasing the research population will give better understanding of impact to all populations.

Unfortunately, the diagnosis of diabetes is often delayed (except in type 1) leading to prolonged periods of uncontrolled hyperglycemia and consequent risk of acute and chronic complications, and rarely misclassification. Timely and accurate diagnosis, combined with regular follow-up and maintenance of optimal glycemic and risk factor control by cautious use of the available therapies will ensure that these young people have a normal life expectancy with minimal impact of diabetic complications.

Finally, one thing that we have learnt from monogenic diabetes, particularly MODY, is that even when there is a clear case, both clinically and economically, for a precision diabetes approach, implementation may be difficult.

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Clinical Audit Report as preliminary step for Quality Improvement Project on Prescribing Proton Pump Inhibitors for appropriate indications in West Bay Health Center

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Abstract

Background: Proton Pump Inhibitors are largely prescribed to the patients in West Bay health center, Primary Health Care, Doha, Qatar. Patients often continue therapy for extended durations without an end point. Studies have found that up to 70 percent of PPI use is for unapproved indications. Long-term PPI use has been associated with an increased risk of all-cause mortality in two cohorts of institutionalized older persons. The aim of this audit intended to evaluate current practice of PPIs prescriptions against best practice international guidelines and suggest changes for improvement.

Methods: 50 medical records were identified by simple random sampling from a total of 2,021 patient's health records who had been prescribed PPI during the audit period from 1st October to December 2019 and who were reviewed retrospectively based on the audit criteria.

Results: Findings showed PPIs were prescribed for justified indications in 24/50 (49%) health records. 26/50(51%) cases of PPIs prescriptions were found for unjustified clinical indications. PPIs doses for justified indications were also found suitable in 24/24 (100) health records. However, duration of prescribing PIs according to its specific indication were found suitable in 9/24 (37.5%) health records.

PPIs stop date was not documented in 41/50 (82%) health records but it was documented in 9/50 (18%) health records in West Bay Health Center, PHCC-Doha, Qatar

Conclusion: The findings showed partial compliance to the best practice international guideline for prescribing PPIs to patients for justified indications and in suitable doses, but low compliance was found regarding the duration of prescribing PPIs specifically for various justified indications. Stop date of PPIs was hardly documented in 18% of health records.

Key words: Proton Pump Inhibitors, prescribing, quality improvement

Methods

This was a retrospective review of health records of patients who had been prescribed PPIs.

Inclusion Criteria:

Patients on PPIs who are above 18 years old; Both genders; Qatari and Non-Qatari.

Exclusion criteria:

Pregnant women and children below 18 years.

Sample size

50 medical records were identified by simple random sampling from total of 2021 patient's health records who had been prescribed PPI during the audit period from 1st October to December 2019.

Data Source:

Electronic medical records (CERNER)

Audit Tool:

An Excel based audit tool was developed based on audit criteria with assistance of Clinical Audit Team in Corporate Office.

It included fields for data on age, gender, nationality, diagnosis, justified indications, dose, stop date duration of PPIs treatment.

Data Analysis:

Data was analyzed using the Excel program-based audit criteria; simple percentages, and proportion were calculated for interpretation of the findings.

Limitations

Number of reviewed medical records is low. Generalization of results for all health centers cannot be justified.

Indicators

Criterion 1: Physician must consider for following indication for prescribing PPIs:

- Peptic ulcer disease
- H Pylori infection
- Gastroesophageal reflux
- NSAIDs associated ulcers
- Zollinger Ellison Syndrome.

Criterion 2: PPIs should be prescribed for lowest dose and duration appropriate to diagnosis given:

- Duodenal ulcer 4-8 weeks
- Gastric ulcer 8-12 weeks
- Gastroesophageal Reflux 8 weeks

Results

Figure 1: Gender distribution of sampled patients on PPIs ; It shows that 48% are females and 52% are males

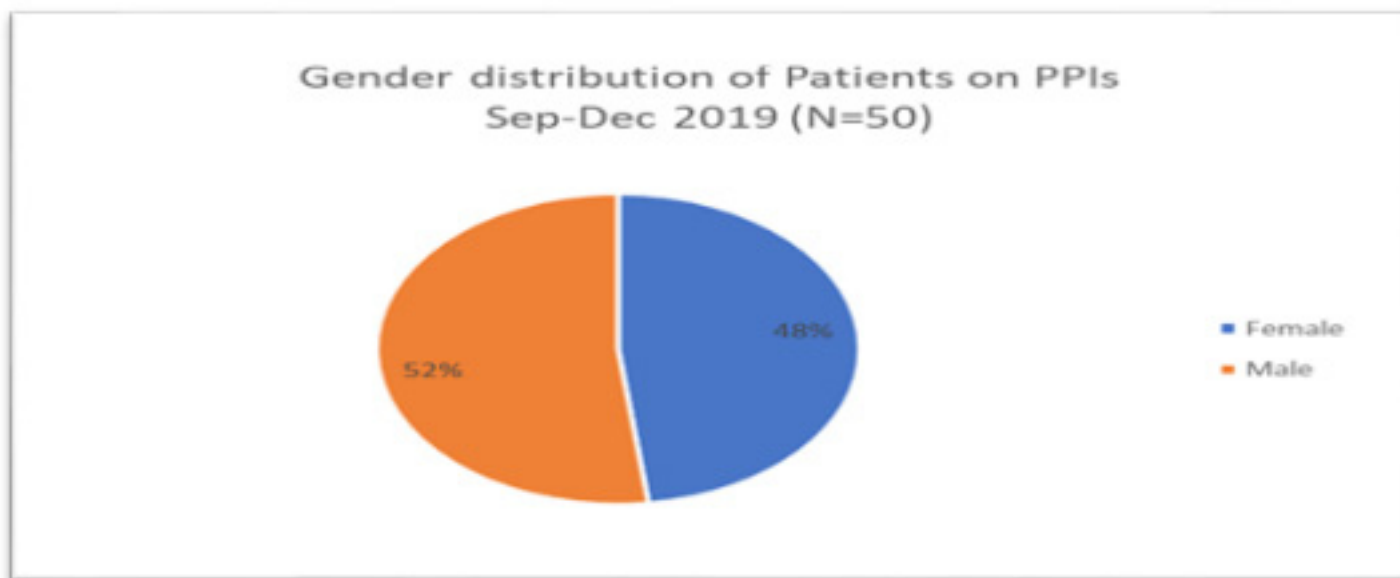


Figure 2: Age distribution of patients on PPIs : it shows most patients lie between 25-36 years and 57-63 years

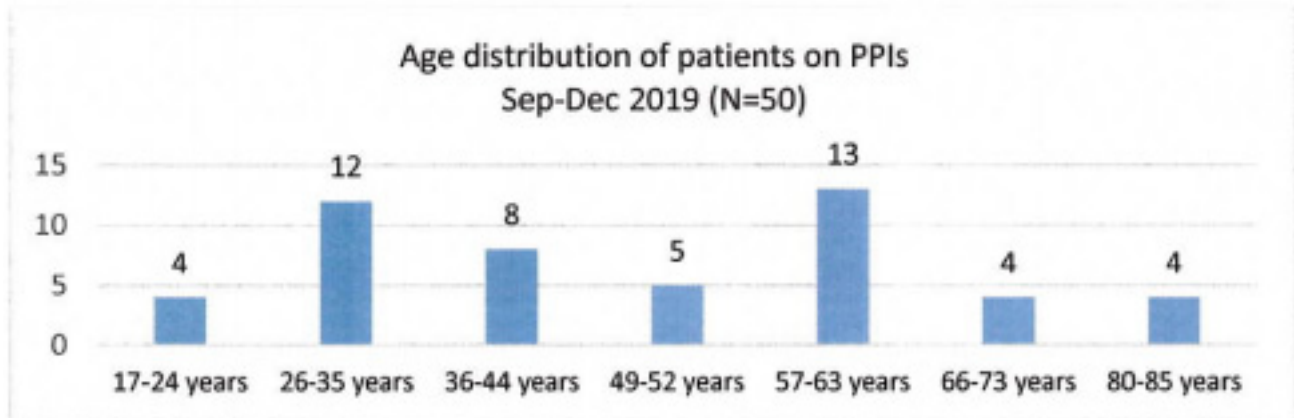


Figure 3: Nationality of patients on PPIs. It depicts distribution of PPI prescriptions according to nationality of patients. 30% of patients included in the sample size were Qatari citizens.

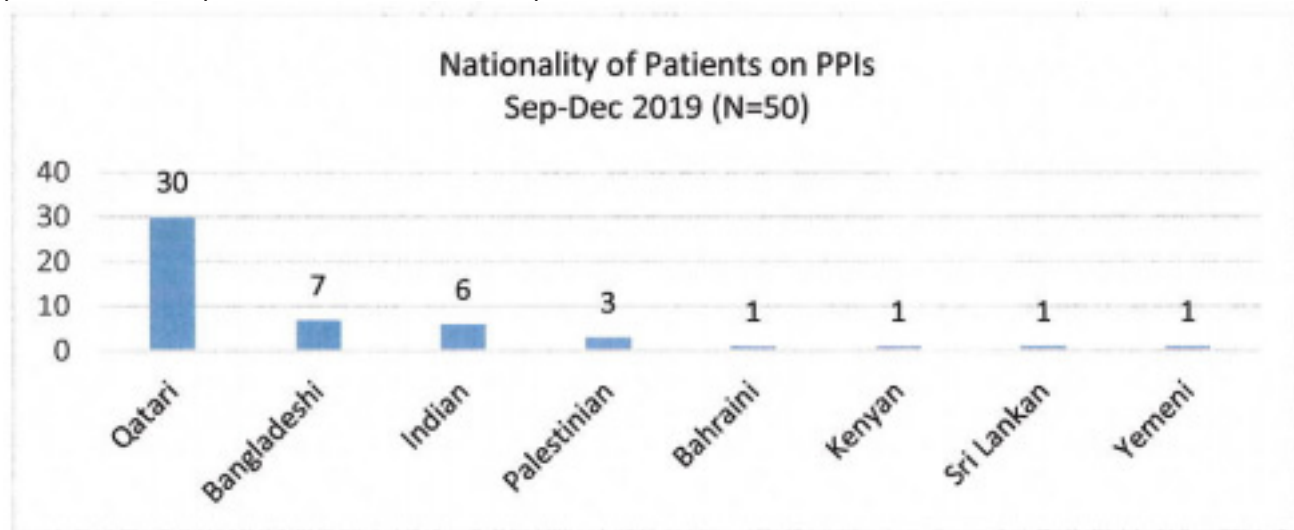


Figure 4: Documented Evidence of justified indications for PPIs (n=50) : it presents that 24/50 (48%) health records had documented justified indications for prescribing PPIs and in 16/24 (66%) cases it was prescribed for peptic ulcer diseases and in 7/24 (29%) the PPIs were given for GERD and in just in one patient it was given for H.Pylori infection. Evidence documented in 26/50 (51%) showed the indications for PPIs prescriptions were not justified as per the best practice international guideline.

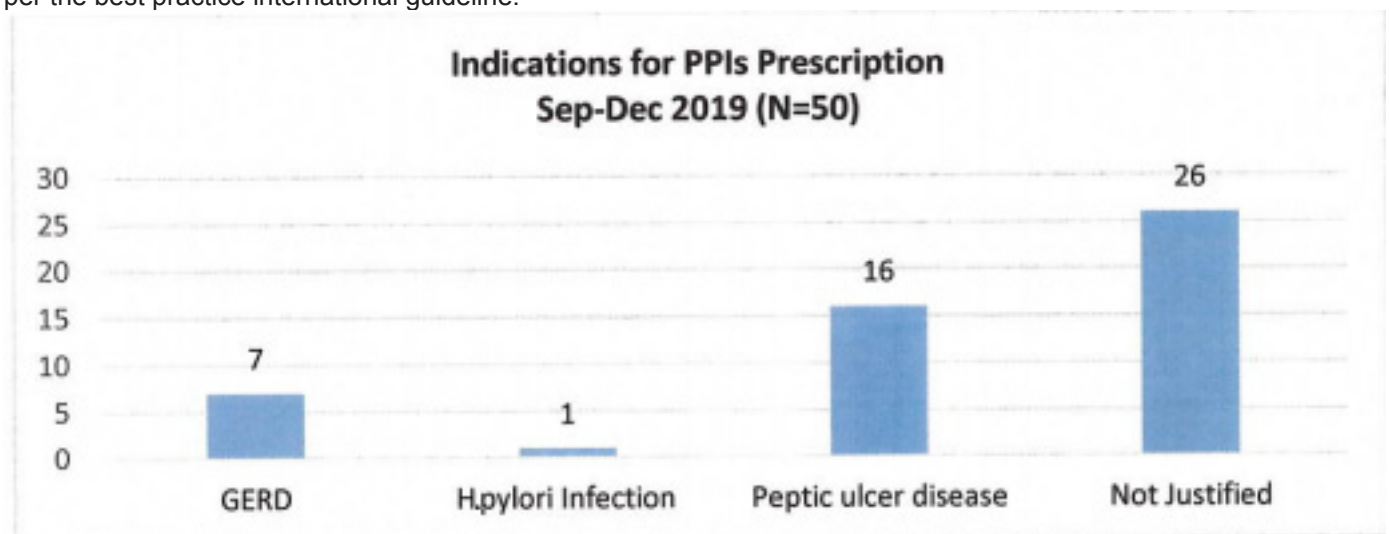


Figure 5: Evidence showing PPIs suitable doses with indications (n=50)

It illustrates that compliance to suitability of PPIs with indications was found in all 24/50 cases (49%) of the total sample but considering compliance to the justified indication in earlier graph which showed that in 24 cases PPIs were prescribed for justified reasons, it can be argued that physicians remained 100% compliant in prescribing a suitable dose for the justified indications. However, likewise, it can also be argued that in 26 cases the PPIs were given for unjustified indications so for the same cohort the suitability of dose was 100% non-compliant.

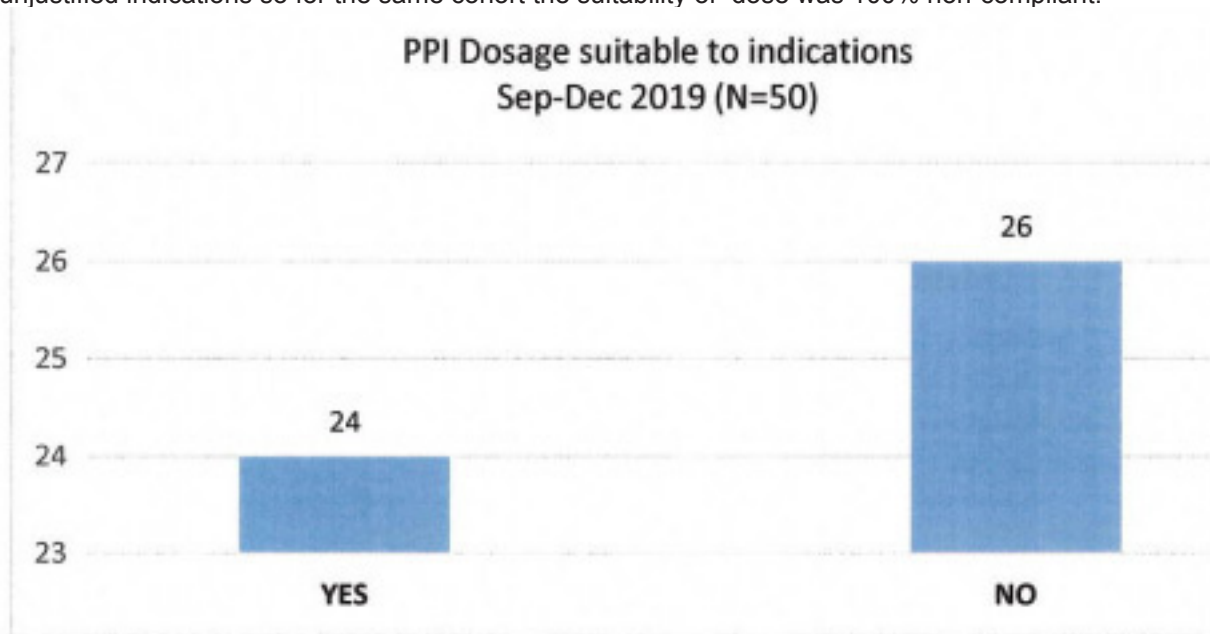


Figure 6. Evidence showing suitability of PPIs duration of treatment with indications (n=50)

As shown in Figure 6, 9/24(37.5%) cases were not suitable which is significant non-compliance. Editor note: As earlier, there is not much point looking at both sets of figures (compliant and non-compliant) as they say the same. One set will always do.

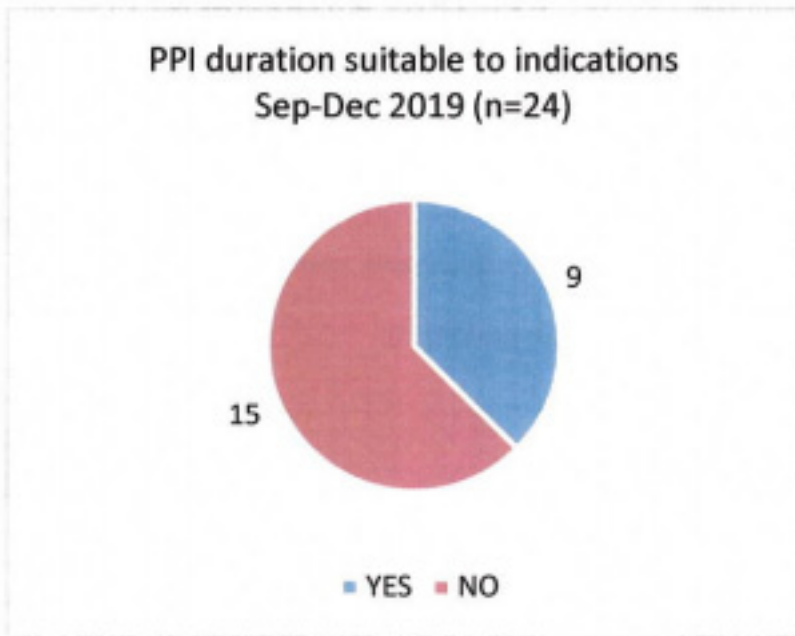


Figure 7: Evidence showing spread of duration of PPIs prescribed (41)

It shows that 41/50(82%) health records showed evidence of ongoing PPIs, ranging from 4- 44 months.

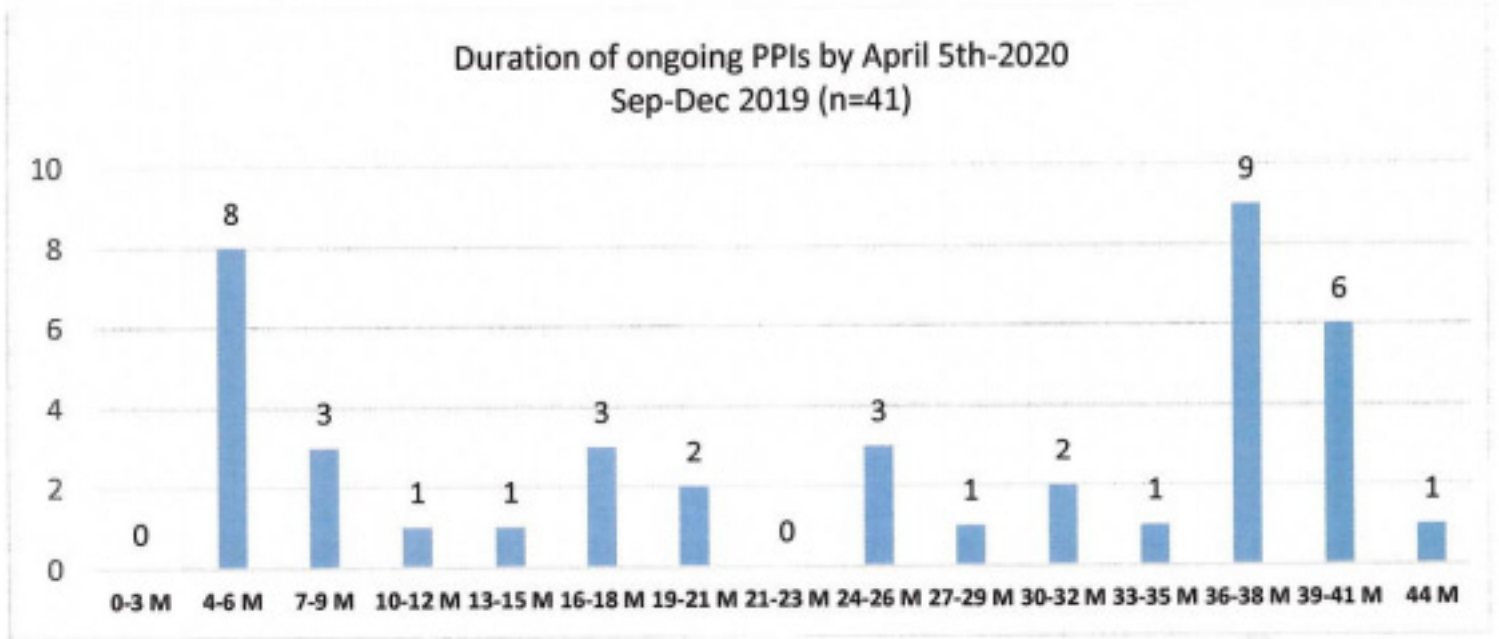


Figure 8. Evidence showing unjustified indications of PPIs use.

It indicates physicians have prescribed PPIs for wide-ranging unjustified clinical indications based on their clinical judgment. This practice needs to be discouraged.

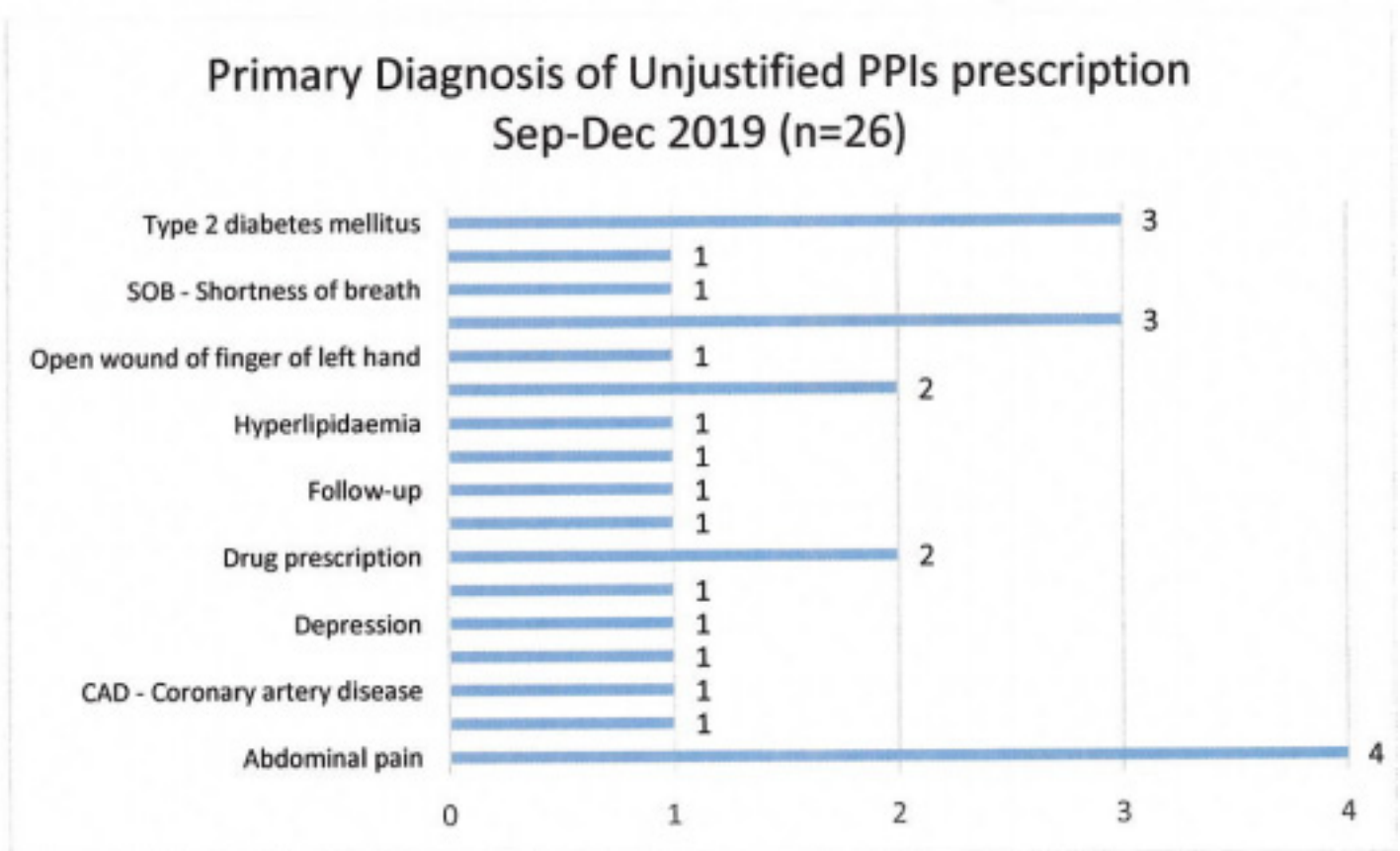
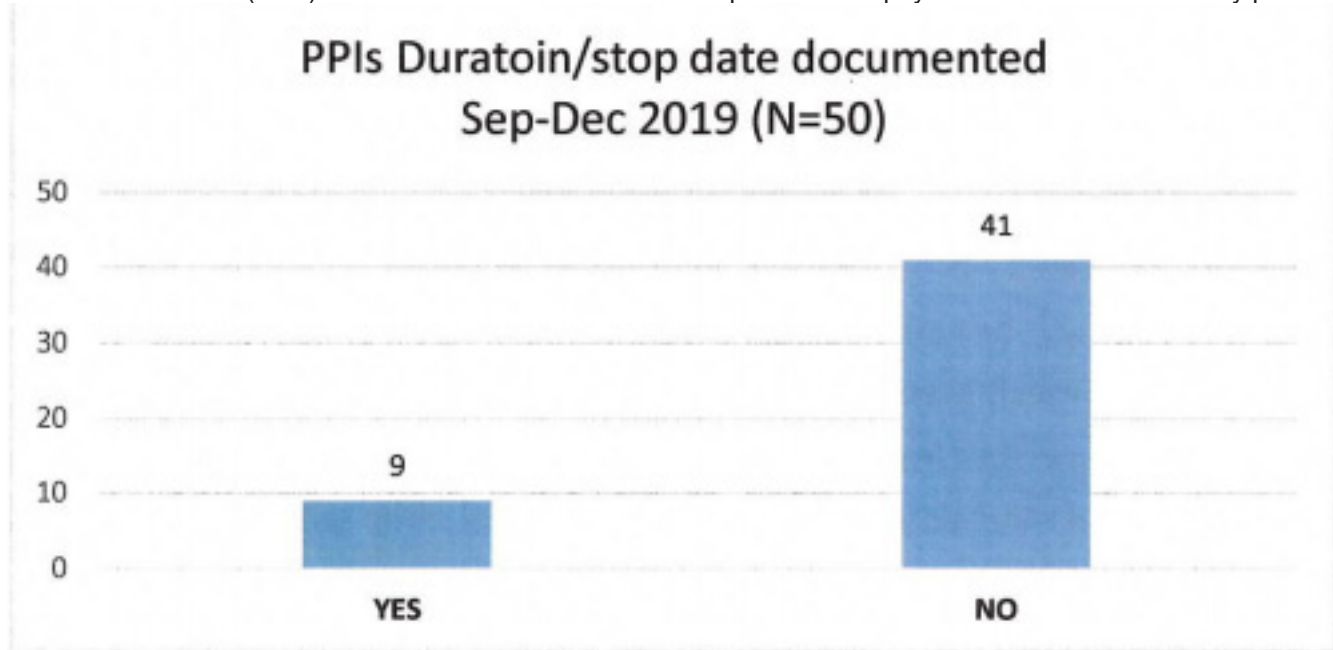


Figure 9: Documented evidence of stop date for PPIs duration

It shows that 41/50 (82%) of health records didn't show a stop date in the physician's notes for PPIs they prescribed.



Points for consideration

- Non-adherence to justified indications for prescribing PPIs
- Not considering suitable duration for specific justified indications
- Not documenting stop date for PPIs

Recommendations

1. Develop PHCC Clinical Practice Guideline for PPIs
2. Conduct training for physicians' on available best practice on prescribing PPIs.
3. Disseminate audit findings and develop consensus on justified indications
4. Arrange CME session for physicians on PPIs
5. Health education for public about use of PPIs.

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Prevalence and association between sleep, stress, and physical activity among medical students in southern region, Saudi Arabia

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Abstract

Background: Sleep is a recurring state of relaxation that is characterized by an altered state of consciousness, with inhibited sensory activity, and muscular inhibition. With sleep the brain can have good attention which is very important for daily activity. Good quality of sleep can get better results in a wide variety of aspects like good quality work performance, less mistakes, no stress, enjoying ones' own daily routine. With low sleep hours, performance in ones' own duties can decline.

Aim: To estimate prevalence and association between sleep, stress, and physical activity among medical students in southern region, KSA.

Methodology: A descriptive cross-sectional approach was used targeting all accessible students. A descriptive Cross-sectional questionnaire survey was used. Study setting: The study was conducted in southern region, KSA. Study population: all male and female medical students in southern region, Saudi Arabia. Sampling technique: Multi-stratified randomized technique.

Results: The study included 490 medical students whose ages ranged from 17 to 28 years old with mean age of 22.7 ± 1.7 years. Male respondents were 256 (52.2%) and 310 students (63.3%) were in the clinical grades (4th -6th) and 49 (10%) were interns. Exactly 351 students (51.2%) reported that their sleep quality is either bad or fairly bad. As for perceived stress level among the medical students (Table 3), low stress level was diagnosed among 67 (13.7%) students, moderate stress among 355 (72.4%) students while 68 (13.9%) students had a high stress level. Considering physical activity pattern, Table 4 demonstrates that 291 (59.4%) students never practice vigorous sports while 51 (10.4%) practice it for 4-7 days per week.

Conclusions: In conclusion, the study revealed that students had poor sleep hygiene, high stress, and improper practice of physical activity.

Key words: Sleep hygiene, stress, physical activity, students, relation, performance, effect

Background

Sleep deprivation and stress are linked to each other and they are involved in the hypothalamo-pituitary-adrenal (HPA) axis [1-3]. Medical students with high levels of stress may have decrease in concentration and cognitive functions [4]. They may also suffer from burnout (approximately 52%) and depressive symptoms (40 %) [5]. Students face a lot of challenges that put them in a high level of stress, such as homework, seminars and CV requirements provoking them to make more time for work [6]. Academic performance is declining due to sleep deprivation and this is due to multiple requirements in the college in a short time and not allowing for sleep as one of the top priorities [3, 6]. Studies show that there is relation between negative between stress and physical activity so that students academic performance may decline \ and weight may increase [4, 7, 8]. The aim of this study is to confirm the relationship between sleep quality, physical activity, and academic stress among medical students in the southern region of Saudi Arabia. One of the most important factors can affect sleep quality is stress. Medical students around the world have reported a high ratio of stress, for example in Pakistan (60%), Thailand (61%), Malaysia (42%), and the United States (57%) [9-11]. Many studies confirm medical students have a sleep disturbance. [6, 12-14, 16]. If the medical students have poor sleep quality it may affect many aspects of physical and emotional health like cognition and memory, depression, irritability, and may also affect academic performance [13]. On other hand, 12-week physical activities programmes have shown an improvement in sleep quality among female university students [15]. There is, however, lack of studies that emphasizes the relationship between sleep quality, physical activity, and academic stress among medical students. The aim of this study is to confirm the relationship between the sleep quality, physical activity, and academic stress among medical students in the southern region of Saudi Arabia. Some studies indicate that college students are lacking physical activity. Two of them were specifically conducted on medical students and one of them can point to a possible cause of burnout in undergraduate medical students [17, 18, 20, 21]. A study suggests that students doing physical activity during medical school may improve the counselling of physical activity that as future clinicians need to provide for the patients [19]. Those medical students lacking physical activity are susceptible to emotional exhaustion, depersonalization, and reduction in personal accomplishment [21]. A study indicates that physically active medical students have higher GPA than physically inactive medical students [22].

Methodology

An online questionnaire based descriptive cross-sectional approach was used targeting all students in King Khalid University, Abha, Saudi Arabia, during academic year 2019-2020. The study was conducted during the period from April 2019 to June 2020. Students with disability, chronic psychological disorders, and who had prescribed hypnotics were excluded. Data

were collected using an online questionnaire which was constructed by the researchers after intensive literature review and expert's consultation. The questionnaire data included student's socio-demographic data such as age, gender, body mass index, and GPA. The Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep hygiene among students [23]. Perceived Stress Scale (PSS) formed of 10 items was used to assess degree of stress among students [24]. The International Physical Activity Questionnaires (IPAQ) which comprises a set of 4 questionnaires was used to assess physical activity among included students [25]. Long (5 activity domains asked independently) and short (4 generic items) versions for use by either telephone or self-administered methods are available. The questionnaire was uploaded online using social media platforms by the researchers and their relatives and friends to be filled out by all the population in Aseer region. A consecutive convenience sampling method was used due to the current lockdown and lack of physical contact due to COVID-19 pandemic. All those who received the electronic questionnaire during the study period and who fulfilled the inclusion criteria were invited to participate through filling in the questionnaire. The ethical approval of IRB at King Khalid University was taken before starting data collection. Data were analysed using SPSS version 22 using two tailed tests with level of significance of 0.05. Descriptive analysis was done using frequency and percentage for different variables including demographic data GPA, personal habits, sleep items, stress, and physical activity. Categorization for sleep and stress scales were based on attached scales and attached scoring methods. For PSQI, global score was calculated after having different components scores (7 components) with score ranging from 0-21. Students who had a score of 13 points or more were considered to have good sleep pattern. Regarding PSS, total score was calculated after reversing positive items scores, then categorized into low, moderate, and high levels reference to scale reported values. Cross tabulation was used to assess distribution of students' sleep hygiene, perceived stress level, and physical activity practicing from their personal data. Also, relation between perceived stress level and students sleep hygiene and physical activity was tested using unadjusted regression model.

Results

The study included 490 medical students whose ages ranged from 17 to 28 years old with mean age of 22.7 ± 1.7 years. Male respondents were 256 (52.2%) and 310 students (63.3%) were in the clinical grades (4th -6th) and 49 (10%) were interns. Exactly 222 (45.3%) students were at normal weight while 102 (20.9%) were either obese or morbidly obese. The majority of the students were single (93.7%; 459) and 52 (10.6%) were smokers (Table 1).

Table 2 illustrates sleep hygiene among the respondent students. Exactly 351 students (51.2%) reported that their sleep quality is either bad or fairly bad. According to the Pittsburgh Sleep Quality Index (PSQI), 352 students (71.8%) were poor sleepers with mean score of 6.5 out of 21.

As for perceived stress level among the medical students (Table 3), low stress level was diagnosed among 67 (13.7%) students, moderate stress among 355 (72.4%) students while 68 (13.9%) students had high stress level. Stress score ranged from 3-38 with mean score of 20.1 out of 40.

Considering physical activity pattern, Table 4 demonstrates that 291 (59.4%) students never practice vigorous sports while 51 (10.4%) practice it for 4-7 days per week. This practice was for less than one hour among 119 (59.8%) of the students. Considering moderate sports, 254 (51.8%) of the students reported negative practice while 54 (11%) practice it for 4-7 days weekly. This practice was for less than one hour among 140 students (59.3%). As for walking, 212 (43.3%) of the students practiced walking for 4-7 days weekly. This was for less than one hour among 218 of them (55.3%).

Table 5 illustrates distribution of medical students sleep hygiene, stress level, and physical activity by their personal data. Poor sleep was recorded among 87.8% of students

below the age of 20 years compared to 69.4% of those who were aged 25 years or more ($P=.033$). Exactly 76.1% of the female students had poor sleep quality compared to 68% of males ($P=.046$). Also, poor sleep quality was recorded among 71.6% of students with normal weight compared to 81.6% of those who were morbidly obese ($P=.017$). Considering stress, moderate to severe stress was diagnosed among 91% of female students compared to 82% of males ($P=.004$). Also, non-practicing of sports was reported by 10.7% of females compared to 18.4% of males ($P=.017$).

Table 6 demonstrates association between students' stress level, sleep hygiene and practicing physical activity. Students with moderate to high stress level reported a significant, nearly 6 times more likelihood, poor sleep hygiene than others with low stress ($OR=5.7$; 95% CI: 3.4-9.9). Considering practicing physical activity, students who practice physical activity had a 1.5 times likelihood for high stress than others who did not ($OR=1.4$; 95% CI: 0.76-2.88).

Table 1: Personal data of medical students in Southern region of Saudi Arabia

Personal data	No	%	
Age in years	< 20 years	49	10.0%
	21-24	369	75.3%
	25+	72	14.7%
Gender	Male	256	52.2%
	Female	234	47.8%
Body mass index	Underweight	50	10.2%
	Normal	222	45.3%
	Overweight	116	23.7%
	Obese	64	13.1%
	Morbid obesity	38	7.8%
Grade	Academic (1-6)	131	26.7%
	Clinical (7-12)	310	63.3%
	Intern	49	10.0%
GPA	2-2.5	13	2.7%
	2.5-3	42	8.6%
	3-3.5	104	21.2%
	3.5-4	101	20.6%
	4-4.5	143	29.2%
	4.5-5	87	17.8%
Marital status	Single	459	93.7%
	Married	31	6.3%
Smoking	Non-smoker	438	89.4%
	Smoker	52	10.6%

Table 2: Sleep hygiene among medical students in Southern region of Saudi Arabia

Sleep hygiene	No	%
How would you rate your sleep quality overall?		
<i>Very bad</i>	122	24.9%
<i>Fairly bad</i>	129	26.3%
<i>Fairly good</i>	176	35.9%
<i>Very good</i>	63	12.9%
The Pittsburgh Sleep Quality Index		
<i>Good sleeper</i>	138	28.2%
<i>Poor sleeper</i>	352	71.8%
Range (0-21)	1-18	
Mean \pm SD	6.5 \pm 2.9	

Table 3. Perceived stress level among medical students in Southern region of Saudi Arabia

Perceived stress	Never	Almost never	Sometimes	Fairly often	Very often
How often have you been upset because of something that happened unexpectedly?	14.5%	15.5%	43.3%	15.5%	11.2%
How often have you felt that you were unable to control the important things in your life?	14.7%	15.7%	35.5%	20.8%	13.3%
How often have you felt nervous and stressed?	6.3%	8.6%	35.3%	24.5%	25.3%
How often have you felt confident about your ability to handle your personal problems?	7.8%	14.3%	37.6%	25.5%	14.9%
How often have you felt that things were going your way?	9.2%	15.9%	49.0%	18.8%	7.1%
How often have you found that you could not cope with all the things that you had to do?	8.4%	22.7%	42.2%	18.6%	8.2%
How often have you been able to control irritations in your life?	5.7%	13.1%	45.7%	25.1%	10.4%
How often have you felt that you were on top of things?	10.2%	21.2%	43.9%	18.6%	6.1%
How often have you been angered because of things that happened that were outside of your control?	8.8%	19.4%	38.0%	22.2%	11.6%
How often have you felt difficulties were piling up so high that you could not overcome them?	11.0%	21.6%	43.7%	14.5%	9.2%
Overall perceived stress level	Low		Moderate	High	
	(67; 13.7%)		(355; 72.4%)	(68; 13.9%)	
Range (Mean \pm SD)	3-38 (20.1 \pm 5.6)				

Table 4: Physical activity among medical students in Southern region of Saudi Arabia

Physical activity		No	%
During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?	<i>No vigorous sports</i>	291	59.4%
	<i>1-3 days</i>	148	30.2%
	<i>4-7 days</i>	51	10.4%
How much time did you usually spend doing vigorous physical activities on one of those days?	<i>< 1 hr/ day</i>	119	59.8%
	<i>1 hr/ day</i>	49	24.6%
	<i>2 hrs/ day</i>	20	10.1%
	<i>3 hrs/ day</i>	8	4.0%
	<i>> 3 hrs/ day</i>	3	1.5%
During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.	<i>No moderate sports</i>	254	51.8%
	<i>1-3 days</i>	182	37.1%
	<i>4-7 days</i>	54	11.0%
How much time did you usually spend doing moderate physical activities on one of those days?	<i>< 1 hr/ day</i>	140	59.3%
	<i>1 hr/ day</i>	59	25.0%
	<i>2 hrs/ day</i>	18	7.6%
	<i>3 hrs/ day</i>	14	5.9%
	<i>> 3 hrs/ day</i>	5	2.1%
During the last 7 days, on how many days did you walk for at least 10 minutes at a time?	<i>No walking</i>	96	19.6%
	<i>1-3 days</i>	182	37.1%
	<i>4-7 days</i>	212	43.3%
How much time did you usually spend walking on one of those days?	<i>< 1 hr/ day</i>	218	55.3%
	<i>1 hr/ day</i>	83	21.1%
	<i>2 hrs/ day</i>	61	15.5%
	<i>3 hrs/ day</i>	18	4.6%
	<i>> 3 hrs/ day</i>	14	3.6%

Table 5. distribution of medical students sleep hygiene, stress level, and physical activity by their personal data

Personal data		Poor sleeper		Moderate /high stress		Not practicing activity	
		%	P-value	%	P-value	%	P-value
Age in years	< 20 years	87.8%		95.9%		16.3%	
	21-24	70.2%	.033*	86.2%	.052	15.4%	.429
	25+	69.4%		80.6%		9.7%	
Gender	Male	68.0%	.046*	82.0%	.004*	18.4%	.017*
	Female	76.1%		91.0%		10.7%	
Body mass index	Underweight	78.0%		92.0%		20.0%	
	Normal	71.6%		85.1%		12.6%	
	Overweight	61.2%	.017*	84.5%	.336	15.5%	.291
	Obese	81.3%		92.2%		20.3%	
	Morbid obesity	81.6%		81.6%		7.9%	
Marital status	Single	72.8%	.078	86.3%	.897	15.3%	.180
	Married	58.1%		87.1%		6.5%	
Smoking	Non-smoker	71.5%	.592	87.0%	.217	14.4%	.573
	Smoker	75.0%		80.8%		17.3%	

P: Pearson X² test

* P < 0.05 (significant)

Table 6: Association between students' stress level, sleep hygiene and practicing physical activity

Sleep and physical activity	Perceived Stress level				OR (95% CI)
	Low stress		Moderate /high stress		
	No	%	No	%	
The Pittsburgh Sleep Quality Index					
Good sleeper	42	62.7%	96	22.7%	Ref
Poor sleeper	25	37.3%	327	77.3%	5.7 (3.4-9.9) *
Physical activity					
Not practicing	13	19.4%	59	13.9%	Ref
Practicing	54	80.6%	364	86.1%	1.4 (0.76-2.88)

OR: Odd ratio

CI: Confidence interval

* P < 0.05 (significant)

Discussion

Medical study is considered to be a high stress area of education due to the overload with academic and clinical needs and challenging professionals. This is why it has negative impact on the mental and physical health of the students [26, 27]. Many factors stand behind this situation, including the academic overload, overnight on-call duties, contact with diseases and death, repeated examinations, and comprehensive curricula [28, 29]. Moreover, medical students encounter multiple stressors outside their medical school: physical, social, emotional, and family problems [30-33].

The current study aimed to assess prevalence and association between sleep disorders, and stress, with physical activity among medical students in Abha Saudi Arabia. The study revealed that more than half of the students ranked their sleep quality as bad which was not so far as was detected by the Pittsburgh Sleep Quality Index where more than 70% of the sampled students had poor sleep hygiene. Sleep was more poor among female students than males (76% vs. 68%). Also, young aged students had higher portion regarding poor sleep hygiene, as well as those with high body mass index (obese and morbidly obese students). These findings were consistent with a study conducted in King Abdulaziz University, Saudi Arabia to assess the association of stress with sleep quality among medical students [34]. The study revealed that the prevalence of poor sleep quality (total PSQI score ≥ 5) was 76.4%. In contrast, the current study demonstrated a higher prevalence of stress than that reported among students at a Pakistani medical school (59.7%) and King Saud University (53.2%), respectively [35, 36].

Regarding stress, the current study showed that more than three quarters of the students had moderate to high stress level. Stress was higher among female students at young ages. This is logical as females are less resistant to stressful conditions specially those at young ages who have no experience regarding the medical study environment and workloads. Though, it revealed lower than other Pakistani and Indian medical school students who reported that more than 90% of their students have stress [36, 37]. These variations could be due to the variability of using different stress assessment tools. It is established that the medical training period makes the students face multiple stressors and challenges, [35, 36]. If these challenges are left and neglected, they will contribute to further stress [9]. Medical training alone is considered as a major risk factor for having depressive symptoms which may explain the increased levels of stress and sleep disturbances among the students. Gender variation regarding sleep disturbance and stress reported with the current study compares with other study findings [38, 39]. But there were other studies which showed no gender variation regarding sleep and stress level among students [26, 31].

The study also revealed that there was a significant relation between stress and sleep hygiene, but no relation was found between stress and physical activity and no significant relation between practicing physical activity and sleep quality. Research reported it was evident that moderate physical activities were more popular in scientific research as a physiotherapy method to improve sleep quality. A cross-sectional study showed that neither intensity, nor duration of PA was associated with sleep quality or quantity [40]. Others suggested that regular moderate-intensity activity programmes improve self-rated sleep hygiene in older adults with moderate sleep complaints [41]. According to the results illustrated above, it is reasonable to assume that physical activity and its relation to sleep quality is still questionable, which needs more research.

Conclusions and Recommendations

In conclusion, the study revealed that medical students experienced high levels of stress and poor sleep quality but acceptable level of practicing physical activities. Also, there was a significant effect of stress level on students' sleep quality especially among female young students. The relation between practicing exercises and improving sleep quality is still questionable as the current study failed to provide significant evidence in favour of this relationship. Researchers recommend providing proper help and counselling, health education, and stress coping strategies programs for undergraduate students as part of their clinical rotations. Future studies are recommended to explain the evidence regarding effect of physical exercise in improving sleep quality and detail the relationship between physical intensity and sleep quality.

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There is not any conflict of interest associated with this manuscript to be declared.

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Prevalence of fibromyalgia syndrome in chronic urticaria

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Abstract

Background: Fibromyalgia syndrome (FMS) can coexist with many autoimmune, rheumatic and inflammatory disorders. Chronic urticaria (CU) and FMS are different types of diseases but share many clinical and pathological features. This study aims to evaluate these features and to investigate whether patients with CU are also affected by FMS.

Patients and methods: Eighty two patients with CU and 86 healthy controls were enrolled to this study. All patients were assessed for autologous serum skin test (ASST), and urticaria total severity score (TSS). Body mass index was calculated for all the participants. All patients were assessed according to the 1990 American College of Rheumatology (ACR) classification criteria for FMS and asked questions regarding the associated clinical features of FMS.

Results: A total of 50(60.9%) patients with chronic urticaria were found to have widespread pain. A total of 28 patients met the criteria of FMS with a prevalence rate of 34.1%; of whom, 20(71.4%) were women. FMS associated clinical features were more frequent in patients with CU than in controls. Positive ASST and severe TSS were more frequent in CU patients with FMS than those patients without FMS.

Conclusion: FMS and its associated clinical features are more prevalent in patients with CU than in the general population. Women with CU are more frequently affected by FMS than are men. Awareness of this comorbidity is an essential part in the treatment of CU.

Key words: Autologous serum skin test, Chronic urticaria, fibromyalgia, Urticaria total severity score.

Introduction

Chronic urticaria (CU) is defined as one of the common, distressing skin diseases that adversely affect the patient quality of life (1). It is characterized by the appearance of rapidly evolving, usually itchy wheals that persist for more than six weeks (2). CU occurs as a clinical manifestation of different inflammatory and immunological disorders, or it may be idiopathic (3,4). Although its pathogenesis is not well understood yet, there is evidence that peripheral nerves are implicated in its pathophysiology, and several neuropeptides have been found to be enhanced in CU (5). There is a network that communicates between cutaneous sensory nerves and immune skin cells; when these neuropeptides are released, they will act on the target cells producing erythema, oedema, hyperthermia and pruritus (6). Mast cells, one of the primary effector cells in the pathogenesis and development of urticaria, are located in the upper dermis, where wheal formation and sensory nerve stimulation occur (7). Fibromyalgia syndrome (FMS) is a chronic, generalized pain condition with characteristic tender points on physical examination, often accompanied by a number of somatic, psychological, and emotional symptoms that include fatigue, sleep disturbances, morning stiffness, headache, irritable bowel, cognitive difficulties, anxiety, and depressive disorders (8,9). FMS prevalence rate is 1%-2% in the general population (10). The pathophysiology of FMS is complex and still not fully understood. Previous studies focused on central sensitization, but it is now apparent that the peripheral nerves play a crucial role in the pathogenesis of FMS (11–14). Mechano-insensitive nociceptive C-fibres which are an itch-specific peripheral sensory neuron can reply to histamine ensuing in the launch of neuropeptides, consisting of substance P and calcitonin gene-related peptide (CGRP)(7). A recent study reported that, mast cells have an important role in fibromyalgia (14). Thus, since both cutaneous nerve fibres and mast cells play an important role both in cutaneous inflammation, including CU, and in FMS. The aim of the present study was to investigate the effect of FMS on patients with CU.

Patients and Methods

This was a cross-sectional study carried out in the outpatient departments of Dermatology and Rheumatology in Basra Teaching Hospital from March 2019 to March 2020. A sample of 82 (35 male and 47 female) patients with chronic urticaria, diagnosed by a dermatologist in the dermatology outpatient, and 84 age and sex matched healthy controls recruited from the general population were enrolled for this study. Exclusion criteria were, diabetes mellitus (DM), congestive heart failure, acute or chronic infections, cerebrovascular diseases, major depression, rheumatological diseases, autoimmune thyroiditis, hypothyroidism, hyperthyroidism, history of malignancy, and any other systemic disorders. The age, sex, disease duration, history of widespread pain, and medication history were determined for all patients. Complete blood count (CBC), erythrocyte sedimentation rate (ESR) along

with the antistreptolysin-O (ASO), serum glucose, liver function test, stool sample to check for parasites, hepatitis B surface antigen (HBsAg), hepatitis C antibody (HCAb), rheumatoid factor (RF) and complement levels, antinuclear antibody (ANA), thyroid function tests and chest radiograms were done for all of the patients. Autologous serum skin test (ASST) and urticarial total severity score (TSS) (15) were conducted for all patients. A diagnosis of FMS was confirmed according to the two-stage classification process that was proposed by the 1990 ACR classification criteria for FMS (10). Stage 1 was composed of the patients answering the diffuse widespread pain questionnaire. Stage 2 comprised evaluation of all patients and controls complaining of diffuse pain; this evaluation included the assessment of 18 tender points and 4 control non-tender points through digital palpation with an approximate force of 4 kg (the amount of pressure required to blanch a nail). The four control non-tender points are: the middle of the forehead, the volar aspect of the mid forearm, the thumb nail, and the muscles of the anterior thigh. To meet the diagnostic criteria, musculoskeletal pain had to have been present for at least 3 months, and pain must have been present in 11 or more out of 18 specific tender points on digital palpation. All participants were also asked about the following FMS associated clinical features: morning stiffness, sleep disturbance, fatigue, headache, anxiety, depression, and irritable bowel. Depression and anxiety were assessed by the Hospital Anxiety and Depression Scale (HADS) (16) which consists of 14 items divided into two subscales of seven items each. The subscale value ranges from 0-21 for either anxiety or depression.

Ethical considerations

Informed verbal consent was obtained from all participants prior to their involvement. It was performed in accordance with the standards of the Declaration of Helsinki.

Statistical analysis

SPSS Software version 25.0 was used for data analysis. Percentages and mean was used to present the data in tables. Comparison of study groups was carried out using chi-square test for categorical data, and Student's t-test for continuous data. P-value of < 0.05 was considered statistically significant.

Results

Table 1 shows the demographic distributions of both patients and control groups. From the total 82 patients with chronic urticaria; there were 35(42.6%) males and 47(57.4%) females, and there were 86 (36 male and 50 female) subjects in the control group. Mean age, disease duration and body mass index (BMI) of patients were 30.32±9.8, 5. 5±1.1 and 24.4±4.3 respectively. Mean age and BMI of the control group were 30.31±9.1 and 24.2±4.1, respectively. There were 50(60.9%) patients with widespread pain compared with 10(11.6%) individuals with widespread pain in the control group, which is a statistically significant difference (P<0.05), and there were 28 (34.1%) (20 females and 6 males) patients who fulfilled the 1990 ACR criteria for classification of FMS in the

patients group, compared to 2 (2.3%) in the control group which is also a statistically significant difference ($P < 0.05$) as shown in Table 2. FMS associated clinical features were more prevalent in patients with chronic urticaria than in the control group; the difference is statistically

significant (all $P < 0.05$) as shown in Table 3. Table 4 shows that, CU patients with FMS had positive ASST and severe TSS compared with CU patients without FMS; also the difference is statistically significant ($P < 0.05$) for both.

Table 1: The demographic distribution of patients and controls

Characteristics	Patients	Controls	P value
Total number (%)	82(100%)	86(100%)	
Men	35(42.6%)	36(41.8%)	>0.05 NS
women	47(57.4%)	50(58.2%)	
Mean age	30.32±9.8	30.31±9.1	>0.05 NS
Disease duration (mean)	5.5±1.1		
BMI (mean)	24.4±4.3	24.2±4.1	>0.05 NS

Table 2: Frequency of widespread pain and FMS in patients and controls

Characteristics	Patients	Controls	P value
Total No. (%)	82(100)%	86(100%)	
Widespread pain	50(60.9%)	10(11.6%)	<0.05 S
FMS	28(34.1%)	2(3.48%)	<0.05 S
Men	8(28.5%)	1(50.0%)	
Women	20(71.5%)	2(50.0%)	

Table 3: Frequency of FMS associated features in both patients and controls

FMS associated features	Chronic urticaria 82 (100%)	Controls 86(100%)	P value
Morning stiffness	43(52.4%)	5(5.8%)	<0.05 S
Sleep disturbance	51(62.1%)	5(5.8%)	<0.05 S
Fatigue	47(57.3%)	6(6.9%)	<0.05 S
Anxiety	46(56.0%)	4(4.6%)	<0.05 S
Depression	43(52.4%)	4(4.6%)	<0.05 S
Headache	42(51.2%)	6(6.9%)	<0.05 S
Irritable bowel	56(68.3%)	5(5.8%)	<0.05 S

Table 4: association between FMS with ASST and UTSS

Characteristics	Patient with FMS		Patients without FMS		P value
	No.	%	No.	%	
Total	28	100	56	100	
Positive ASST	26	92.8	27	48.2	<0.05 S
Severe TSS	25	89.2	23	41.1	<0.05 S

Discussion

In this study, widespread pain was found to be more prevalent in the patients with CU than in the control group in a percentage of 60.9% and 11.6% respectively, whereas the prevalence of FMS among patients with CU was found to be 34.1% which is comparable to a study done by Oktayoğlu et al. (2), who found FMS affected 32.5% of his study group. However, the prevalence rate of FMS in patients with CU in our study was lower than that in a study conducted by Torresani et al. (6) who found, a prevalence rate of FMS in CU was 70.6% and declared that, such a high proportion was unexpected. This high result may be related to the inclusion of patients with DM, thyroid dysfunctions, haematological abnormalities, autoimmune disorders, and other systemic diseases in their study. However, the prevalence rate of FMS in patients with CU in our study was comparable to the prevalence rates of 25% in patients with RA, and 30% in patients with SLE (17,18), and it seems to be low when compared to the prevalence rate of 37.5% and 50% in patients with psoriatic arthritis and Sjogren syndrome respectively (19,20). Women showed higher occurrence of FMS than men, in a ratio of 5:2. This result is comparable with findings of other studies that found a female predominance of FMS in different inflammatory and rheumatic disorders (18,21,22).

The prevalence of FMS in our study population is considered high when compared to the prevalence rate in the general population (23). The coexistence of FMS and inflammatory skin disease has been reported in the literature. In fact, FMS is already known to coexist with psoriasis and systemic lupus erythematosus (18,24). Furthermore, the prevalence of autoimmune diseases is very high, both in the CU (25,26) and FMS (27,28) affected populations although the pathophysiology of FMS is complex and still not fully understood. It is likely that multiple processes contribute to the pathogenesis of FM, which is a pathophysiologically and psychologically heterogeneous syndrome. There is a role of psychosocial factors in the development of FMS which appears to be greater for depression and anxiety, and abnormal responsiveness or function of the nervous system appears to be implicated in irritable bowel syndrome, and tension-type headache (13).

The high prevalence rate of FMS in patients with CU in this study may be explained by the common underlying pathogenesis that involves the implication of the peripheral nerves and different neurotransmitters in the pathogenesis of both CU and FMS; when these neuropeptides are released, they will act on the target cells producing erythema, oedema, hyperthermia and pruritus; nociceptive C-fibres respond to histamine resulting in the release of these neuropeptides, in addition to substance P and calcitonin gene-related peptide (CGRP) which are known to be increased in CU skin, and play an important role in the pathogenesis of both CU and FMS (5,6,11–14). Another explanation for the high prevalence of FMS in CU may be related to the role of mast cells in the pathogenesis of both disorders. Studies reported that, mast cell is one of the primary effector cells in the

pathogenesis and development of urticaria, and another recent study conducted by Ang DC et al. (14) reported an increased number of mast cells in all patients with FMS. In addition, SP may stimulate degranulation of mast cells; tryptase release may result in the cleavage of proteinase-activated receptor-2 at the plasma membrane of nerve endings, stimulating the release of CGRP, SP and NKA from nerve endings, thus providing positive FMS/CU feedback (29). Therefore mast cell is considered another common underlying pathway of both CU and FMS, and the use of mast cell stabilizer (ketotifen) may be considered in the treatment of FMS (7,13,14). Morning stiffness, sleep disturbance, fatigue, irritable bowel, headache, anxiety and depression were the most common non-musculoskeletal manifestations recorded in our study group. These FMS associated clinical features were more prevalent in patients with CU compared to the controls. The increased frequency of these symptoms also may be attributed to the common underlying pathogenesis of both CU and FMS. The high frequency of irritable bowel in our study group, may be explained by the common underlying pathogenesis of CC and FMS, which implicates mast cell, because there is evidence that, mast cells play an important role in the pathogenesis of irritable bowel (30,31). Some authors have reported that, patients with this skin disorder usually suffer from both depression and anxiety (32,33), the results of which are comparable to our finding. In this study we demonstrated the association between the status of autologous serum skin test and FMS; Positive ASST was more frequent in CU patients with FMS than those patients without FMS; a result comparable to a study done by Torresani et al (6) who found FMS was associated with positive ASST. Furthermore we found that, FMS was associated with the severity of urticaria total severity score, a result not reported before, therefore, further studies needed to clarify this association. There are remarkable similarities between the CU and FMS that necessitate further clinical and laboratory studies with a larger study population to explain the exact relationship between these two disorders.

Conclusions

FMS and its associated clinical features are more prevalent in patients with CU than in the general population. Women with CU are more frequently affected by FMS than are men. Awareness of this comorbidity and the cooperation between rheumatologist and dermatologist is an essential part in the treatment of CU.

Conflict of interest:

There is no any conflict of interest associated with this manuscript declare.

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Contributions:

All authors participated somewhat equally in the preparation and the achievement of this manuscript by completing the questionnaires in the confrontation with the patients, preparing the literatures and writing the manuscript.

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Virtual Pain Management Clinic during COVID-19 pandemic: Experience from Qatar

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COVID-19 pandemic has had global effects on different healthcare systems (1). Many services were reshaped to cope with current circumstances (2). To accommodate social distancing, most of the clinics were run virtually (3)(4). We would like to share the experience with virtual pain management clinics during the COVID-19 pandemic in Qatar.

Since March 2020, with the emergence of the COVID-19 pandemic in Qatar, the outpatient clinics were run through telephonic conversations with the patients. Moreover, telephonic consultations were introduced to minimize the visits to the Primary Healthcare Centers (PHC). Also, free medication home delivery service was introduced to minimize patients' medication refill visits to health centers and hospitals, to decrease risks of getting and transmitting the virus.

In the pain management clinics, most interviewed patients are those following for traumatic spinal cord injuries and those with neuropathies who have chronic pain necessitating a continuous supply of a wide range of narcotics and analgesics. During the COVID-19 pandemic, we have noticed an increase in the number of consulted patients by around 50%, which is most probably due to the new convenient telephonic consultation system. Despite that, the service was maintained with high efficiency which was reflected in the observed patients' satisfaction. The Call center was not assigned only for refill of medication appointments, but also accepted acute consultations

and assisted patients to get face to face appointments if indicated.

The high population awareness about the pandemic was impressive as shown by the understanding of the importance of the virtual clinic to comply with social distancing. Many patients opted not to come to the clinics until the pandemic is over, and would prefer to come and collect their medications only. It is important to note that, unlike other services, narcotic medications need to be collected in person after showing identity cards. Recently, we started calling a small number of patients to attend the clinics when we feel that the nature of their pain has changed and they need examination and further evaluation.

There was cancellation of most elective chronic pain management procedures except for those whose pain was highly indicated like sciatica pain, as if it was left without management or delayed, it may result in increase in pain, depression and disability (5). Suspicion of conditions like spinal fracture or cauda equina syndrome needs emergency intervention. Procedures mainly are conducted in a hospital room designated for such purposes to guarantee more precautions, unlike before the COVID-19 era where procedures were done as out-patient or office-based procedures. All patients should do the PCR test 48 hours before the procedure and the test should be negative so the procedure can be performed. Training of pain fellows and anesthesia residents may be affected

because of less exposure to patients and interventional procedures. Anyhow, we have noticed some patients are persistently preferring pain interventions over medications despite the current restrictions on elective procedures.

According to our research, no randomized controlled trials RCTs were done regarding the effects of steroids used in pain management procedures and the increased risk to COVID-19 or virus transmission. Corticosteroids impact on clinical outcomes in patients with influenza is controversial. A systematic review and meta-analysis conducted on ten trials involving 6,548 patients showed corticosteroids were associated with higher mortality, longer stay in the intensive care unit and a higher rate of secondary infection (6). Anyhow, we decreased the steroid dose in pain management procedures to reduce any possible risk of harm to our patients, especially those who are immunocompromised and high-risk.

Overall, we find the experience in the pain management clinics during the COVID-19 pandemic is promising and will have an impact after the return to normal services once the pandemic is over.

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Telemedicine difficulties for Family Physicians in dermatological cases

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Introduction

Whilst the general public panics about Covid-19, family physicians are facing difficulties in assessing skin-related cases, especially when dealing with patients concerned about undiagnosed skin conditions.

Material and Methods

The task of history taking is not only complex but also depends on the patient's literacy (for example one patient was confused with a simple benign skin tag and on the other hand a mother would like to confirm a diagnosis for Molluscum contagiosum). Some patients give a very thorough and detailed history, while others require more probing in order to reach a probable diagnosis.

I gathered a few common telephone cases (fungal, atopic, squamous vs basal CC and melanomas) to discuss during presentation. My plan is to use tool of consensus to select safe decision making in managing these concerned patients appropriately and timely (emergency skin rashes including infectious diseases related are excluded in this discussion).

Case 1

A 20 year old man called regarding dry, cracky and mildly itchy lesion on the right 2nd toe for the past 6 weeks. He plays sports regularly but due to Covid-19, he is not going out often and not using socks/trainers as he used to while playing sports. He is worried that he might have fungal infection. PMH: eczema in childhood. Pictures presented with consent:



Before treatment

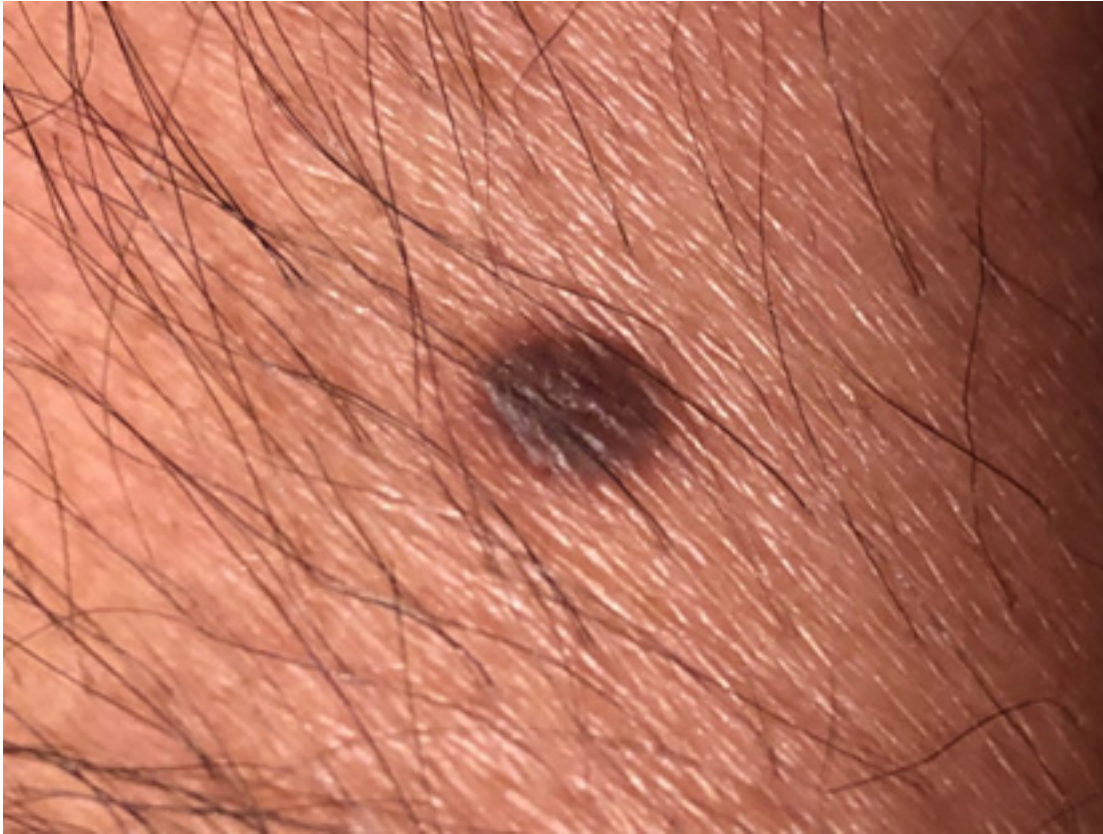
He was treated with Hydrocortisone 1% over the counter via telephone for eczema and 10 days later his lesion improved (picture attached). Eczema most often starts in infancy and affects two of ten children; it is also highly prevalent in adults (1).



After treatment

Case 2

A 45 year old gentleman concerned about a mole on his leg since childhood, but recently got bigger, raised and itchy. On asking further he mentioned that the mole is black colour and around a pea size. He is not known to have any family history of Melanoma but he was concerned and would like to get it checked. PMH; fit and healthy. He was booked in office appointment two days later from that day. His lesion was measured 6mm but due to recent increase in size, raised and itchy he was referred to Dermatology on semi-urgent basis.



Remember the ABCDE rule while taking history and in-office evaluation: **A**symmetry (one half of the mole doesn't match the other), **B**order irregularity, **C**olour that is not uniform, **D**iameter greater than 6 mm (about the size of a pencil eraser), and **E**volving size, shape or colour.

Asymmetry



Normal Mole –

Abnormal Mole

Borders

Normal Mole –

Abnormal Mole

Colours

Normal Mole –

Abnormal Moles

Diameter

Normal Mole –

Abnormal Mole

Evolving

If you notice any CHANGE in size, shape or elevation of a mole, or experience any new symptom such as bleeding, itching or crusting, consider referral.

Criteria for Referral — Primary care clinicians who identify a skin lesion that is not clearly benign should have a relatively low threshold for referral to a dermatologist for dermoscopic examination and evaluation for biopsy, if indicated. Guidelines published in 2010 by the British Association of Dermatologists suggest the following indications for referral [2]:

- A new mole appearing after the onset of puberty that is changing in shape, colour, or size
- A longstanding mole that is changing in shape, colour, or size
- Any mole that has three or more colours or has lost its symmetry
- A mole that is itching or bleeding
- Any new persistent skin lesion, especially if growing, pigmented, or vascular in appearance, and if the diagnosis is not clear
- A new pigmented line in a nail, especially where there is associated damage to the nail
- A lesion growing under a nail

His mole was excised and biopsy results returned as benign Lentiginous naevus.

Case 3

A 57 year old female called me for lesion on her chest for past 3 months, since exposure to sun recently it has become more prominent and itchy causing her concern to ask me for assessment face to face. She explained it as a red raised skin bump of around less than 5mm in size. She has strong family history of Squamous cell carcinoma otherwise fit and well. She was booked for next day face to face in-office appointment.



She was on the spot given liquid nitrogen therapy for possible Actinic Keratosis (AK) and prescribed 16 weeks treatment of Imiquimod 5% and referred to Dermatology on routine.

AKs are a concern because the majority of cutaneous SCCs arise from pre-existing AKs, and AKs that will progress to SCC cannot be distinguished from AKs that will spontaneously resolve or persist [3,4]. Because of these factors, most clinicians routinely treat AKs [5].

Case 4

A 50 year old asian man called for skin lesion around the nose beneath lower eye lid corner for several months, increased in size and more raised during last 6 months when he was transferred to Africa from Europe. Black in colour, never bleeds, itches or discharges. No family history of skin cancers. Patient is concerned about cancers. He was seen in the clinic two days later and referred to Dermatology on routine.



The lesion was diagnosed as seborrheic keratosis based on the clinical appearance of “stuck on,” warty, well-circumscribed (often scaly hyperpigmented lesions located most commonly on the trunk, face, and upper extremities). Close inspection with a hand lens often will demonstrate the presence of horn cysts or dark keratin plugs. Examination with a dermatoscope shows multiple milium cysts, comedo-like openings, and fissures and ridges forming a cerebriform pattern (6). It can left without treatment if small and not bothersome to patient. Commonly treated with cryotherapy or tri-chloroacetic acid peel.

Sometimes, seborrheic keratosis may resemble basal cell carcinoma, squamous cell carcinoma or melanoma. BCC and SCC are slow growing tumours and more common in whites than blacks or Asians. Hence referral on routine would be safe option when not sure and confused with seborrheic vs BCC vs SCC. But if suspected melanoma, then referral 2 week route would be safest option.

Results

A probable diagnosis may be acceptable with simple cases like dermatitis but can turn out to be disastrous in ruling out cancer. I have developed a safest approach to deal with such difficult cases, which is good history taking, efficient use of time and resources to see these patients safely and plan management accordingly.

Discussion

Using efficient history taking with proper planning, we can reach safe management plan during this Covid-19 virtual care and avoid any risk or harm to patients with concerns of skin cancer or skin conditions becoming worse.

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Early Diagnosis of an Ectopic Pregnancy in patient with Irregular Menstrual Bleeding

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Abstract

Female patient presented with irregular vaginal bleeding diagnosed with right tubal ectopic pregnancy after requesting an early pregnancy test and pelvic ultrasound which came as positive; helping in early diagnosis of ectopic pregnancy case. The case illustrates the importance of careful history taking and early suspicion of pregnancy and its complications in any female in childbearing period with any abnormal vaginal bleeding.

Key words: irregular menstrual bleeding, ectopic pregnancy

Introduction

An ectopic pregnancy is an extrauterine pregnancy. Almost all ectopic pregnancies occur in the fallopian tube (96 percent), but other possible sites include cervical, interstitial, hysterotomy (cesarean) scar, ovarian, or abdominal {1}. In rare cases, a multiple gestation may be heterotopic (including both a uterine and extrauterine pregnancy).

●Abdominal pain and vaginal bleeding are the most common symptoms of ectopic pregnancy {2}. Ectopic pregnancy should be suspected in any women of reproductive age with these symptoms, especially those who have risk factors. However, over 50 percent of women are asymptomatic before tubal rupture and do not have an identifiable risk factor for ectopic pregnancy {3}.

Case

33 years old female p3 +1 abortion, known hyperthyroidism on Carbimazole and on Methyl Aldomet for hypertension, as well. She was on IUCD (Intra Uterine Contraceptive Device) for 5 years then stopped it for more than 1 year trying to conceive but failed. She came for result review for her blood tests done for her irregular menses and secondary infertility?, On that day 1ST December 2019 she was on her 6th day of her 2nd menstruation this month (as she thought). The first menstrual period this month was on 16th of November 2019 and previous one was on 10/10/2019. Her laboratory result checked showing low AMH (Anti Mullerian Hormone) and normal other hormonal level .

On examination: vital signs were within normal (blood pressure: 129/85 mmhg, heart rate: 90 bpm, temperature: 36.8 c), patient looked stable, not in pain but noted that only patient has mild suprapubic tenderness on abdominal examination.

Investigations requested: beta HCG and urgent pelvis ultrasound requested to rule out pregnancy (ectopic/abortion),
2nd day of seeing patient result came as positive for B. HCG at the level of b-HCG 193 IU/ML so patient contacted on her phone and asked to go direct to Women Wellness and Research Center (WWRC) Emergency to rule out ectopic pregnancy.

Figure 1

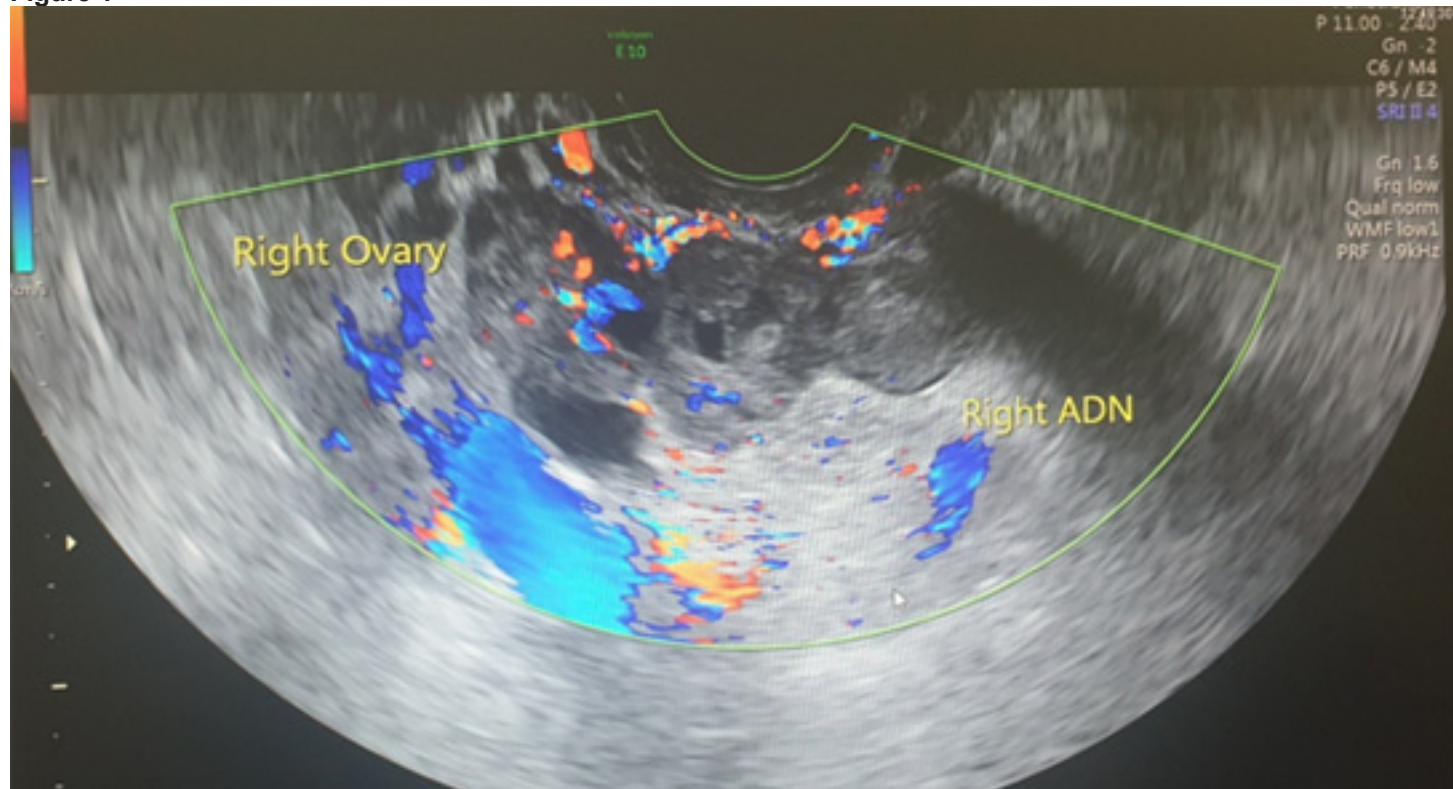


Figure 1 shows right adnexal rounded hyperechoic lesion with central translucency.

Patient admitted and her emergency ultrasound showed right adnexal rounded hyperechoic lesion with central lucency representing gestational sac with adjacent small hematoma /hematosalpinx suggesting right tubal ectopic pregnancy with hematoma.

The case was diagnosed with ectopic pregnancy and followed up for 48 hours. B.HCG level was found to be decreasing and currently she is for expectant management of ectopic pregnancy.

The indication for expectant management of ectopic pregnancy is a suspicion of ectopic pregnancy in a woman who meets the selection criteria for expectant management. The patient must also prefer expectant management rather than Methotrexate or surgical treatment.

Selection criteria; When ectopic pregnancy is suspected, in our practice, we offer expectant management only for women who meet ALL the following criteria: Asymptomatic, Understand the clinical implications and risks of an ectopic pregnancy, Ready access to a medical facility if emergency surgical treatment is needed, Able and willing to comply with close follow-up, Transvaginal ultrasound (TVUS) does not show an extrauterine gestational sac or demonstrate an extrauterine mass suspicious for an ectopic pregnancy, and Serum quantitative beta-human chorionic gonadotropin (hCG) concentration is low (≤ 200 mIU/mL) and decreasing [4].

We define we define beta -HCG decreasing as a decrease of >10 percent across two consecutive measurements. Some guidelines advise offering expectant management to patients who meet the above criteria and have an hCG ≤ 1000 mIU/mL [5].

Conclusion

In females during their childbearing period coming with any irregular vaginal bleeding; they should be evaluated for pregnancy and its complications as early as possible; for exclusion of serious ectopic pregnancy and better outcome if diagnosed early.

Discussion

The case presented with irregular menstrual bleeding and at the first presentation pregnancy test was missed as the first required test to exclude pregnancy complications and most seriously ectopic pregnancy which if missed may endanger the life of patient {2}.

Diagnosis of ectopic pregnancy in female is usually tricky and needs high suspicious index from the family physician and as a rule pregnancy and its complications should be of high priority in investigating any female in childbearing period coming with any irregular or abnormal vaginal bleeding. Early symptoms such as abdominal pain although the commonest, is not specific to ectopic pregnancy {6}.

Normal pregnancy discomforts (eg, breast tenderness, frequent urination, nausea) are sometimes present in addition to the symptoms specifically associated with ectopic pregnancy. There may be a lower likelihood of early pregnancy symptoms in women with ectopic pregnancy because progesterone, estradiol, and human chorionic gonadotropin may be lower in ectopic pregnancy than in normal pregnancy [7-9].

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conceive but failed, she came for result review for her blood tests done for her irregular menses, and secondary infertility. Beta HCG and urgent pelvis ultrasound requested to rule out pregnancy (ectopic/ abortion), 2nd day of seeing patient result came as positive for B. HCG of 193 so patient contacted on her phone and asked to go direct for WWRC Emergency to rule out ectopic pregnancy. The case diagnosed with ectopic pregnancy and followed up by 48 hours B.HCG level which found to be decreasing and currently she is for expectant management of ectopic pregnancy.

Prof AlSabaani did a cross-sectional study to explore physicians and nurses' overall attitudes and perceptions towards patient safety culture and to evaluate any differences in their cultures. The study included 369 participants. The majority of participants were females (70.7%). The mean score for the overall patient safety grade was 72.3. A statistically significant difference between physicians and nurses were found in 8 dimensions out of 12 dimensions of patient safety culture. The authors concluded that nurses and physicians scored patient safety differently. Their perceptions regarding "teamwork within units", "organizational learning-continuous improvement" and "feedback and communication" were good. However, other patient safety dimensions need to be improved. Overall, nurses' perceptions are significantly better than physicians' perceptions. To improve healthcare delivery in the region, capacity-building programs should focus on improving the patient safety culture among health care providers, in general and with physicians in particular. Further studies are recommended among healthcare workers at other levels of healthcare in the region in order to improve patient safety practices.

Shehata et al., did a descriptive cross-sectional approach was used to estimate Prevalence and association between sleep, stress, and physical activity among medical students in southern region, KSA. The study included 490 medical students whose ages ranged from 17 to 28 years old with mean age of 22.7 ± 1.7 years. Male respondents were 256 (52.2%) and 310 students (63.3%) were in the clinical grades (4th -6th) and 49 (10%) were intern. Exact of 351 students (51.2%) reported that their sleep quality is either bad or bad. As for perceived stress level among the medical students (table 3), low stress level was diagnosed among 67 (13.7%) students, moderate stress among 355 (72.4%) students while 68 (13.9%) students had high stress level. Considering physical activity pattern, table 4 demonstrates that 291 (59.4%) students never practice vigorous sports while 51 (10.4%) practice it for 4-7 days per week. The authors concluded that students had poor sleep hygiene, high stress, and proper practice of physical activity.

Ahmed K et al., looked at virtual pain management clinic during Covid-19 in Qatar. With the emergence of the COVID-19 pandemic in Qatar, the outpatient clinics were run through telephonic conversations with the patients. In the pain management clinics, most interviewed patients are those following for traumatic spinal cord injuries and those with neuropathies who have chronic pain necessitating a continuous supply of a wide range of narcotics and analgesics. During the COVID-19 pandemic, we have noticed an increase in the number of consulted patients by around 50%, which is most probably due to the new convenient telephonic consultation system. Despite that, the service was maintained with high efficiency which was reflected in the observed patients' satisfaction. The authors found the experience in the pain management clinics during the COVID-19 pandemic is promising and will have an impact after the return to normal services once the pandemic is over.

Dr. Najam Khan discussed telemedicine difficulties for Family Physicians in dermatological cases. He stressed that family physicians are facing difficulties in assessing skin-related cases, especially when dealing with patients concerned about undiagnosed skin conditions. The task of history taking is not only complex but also depends on the patient's literacy (for example one patient was confused with a simple benign skin tag and on the other hand a mom would like to confirm diagnosis for Molluscum contagiosum). Some patients give a very thorough and detailed history, while others require more probing in order to reach a probable diagnosis. The authors included few common telephone cases (fungal, atopic, squamous

vs basal CC and melanomas) to discuss during presentation. He used tool of consensus to select safe decision making in managing these concerned patients appropriately and timely (emergency skin rashes including infectious diseases related are excluded in this discussion).

Alqurashi et al., did a cross-sectional study through an online survey on 6113 of residents to assess the attitude and awareness about heart attack symptoms and lifesaving actions among those population. A pre-designed questionnaire was used to collect data about sociodemographic characters, having a heart disease, a heart attack in the participant. 40% of the participants heard about heart attacks and 65.5% knew that the first step to take if they witness a person suffering from symptoms of heart attack was to call the ER. Participants with a university education, who had a medical specialization, who had a heart disease himself or had a heart attack in one of his/ her family and those who had a friend as a source of information had a significant higher mean Knowledge score about heart attack and CPR. The authors concluded that there is a need to raise knowledge about heart attack and train the Saudi population in lifesaving action by conducting training courses and awareness campaigns.

Arain et al., did an online cross-sectional case-control study among cases of women diagnosed with EP and controls of women who had normal pregnancy. The aim was to assess the association and evidence supporting the relationship between appendectomy and EP. The mean age of the participants was (36.71 ± 11.49) years, 11.9% had a family history of EP, 77.3% used intrauterine devices, 13.9% had a previous history of a pelvic intervention, 9.9% had a past history of pelvic inflammatory diseases, and 22.8% had a history of appendectomy. Cases had a significant higher percent of those who suffered pelvic inflammatory diseases and those who had a history of appendectomy compared to controls. The authors concluded that there is need for taking a careful history from all pregnant women to assess any risk factors of ectopic pregnancy and to make a proper management to all health problems that may be considered a risk factor of EP.

Mathkhor et al., stressed that Fibromyalgia syndrome (FMS) can coexist with many autoimmune, rheumatic and inflammatory disorders. Their study aims to evaluate these features and to investigate whether patients with CU are also affected by FMS. Eighty two patients with CU and 86 healthy controls were enrolled to this study. All patients were assessed for autologous serum skin test (ASST), and urticaria total severity score (TSS).

A total of 50(60.9%) patients with chronic urticaria were found to have widespread pain. A total of 28 patients met the criteria of FMS with a prevalence rate of 34.1%; of them, 20(71.4%) were women. The authors concluded that FMS and its associated clinical features are more prevalent in patients with CU than in the general population. Women with CU are more frequently affected by FMS than are men. Awareness of this comorbidity is an essential part in the treatment of CU.

Saleh et al., did a retrospective case control study done in Women cancer Center. The study aimed at identifying risk factors associated with ECA. All complete Patient records from Jan. 2016-July 2019 was reviewed, (2176) women records was included in the study. Epithelial cell abnormality found among 508(23.3%). Cervical epithelial cell abnormality was higher among those aged > 45 years 199(39.2%), widow 9(1.8%) and divorced 4(0.8%). About 102 (20.1%) of those with epithelial cell abnormality had the 1st sexual contact at age < 15 years, in comparison with those with normal cytology 285(17.1%). Post coital bleeding as a presenting symptom was higher among those with ECA 105(20.7%). Bivariate logistic analysis showed significant relation with age groups of 45 years or older (Adjusted odds ratio (AOR) 1.4, 95 % CI: 1.1 – 1.81.). Post coital bleeding (AOR 1.92, 95 % CI: 1.1 – 3.43). High percent of women had ECA. The most common risk factors was age older than 45 years, the 1st sexual contact at age < 15 years, and high parity >3, and post coital bleeding.

